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SPACE-PROVISIONS IN THE FLOOR-PLANS OF MODERN HIGH-SCHOOL BUILDINGS

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NATURE, MATERIALS, AND METHOD OF THE STUDY

What are the more common kinds of space-provision made in the floor-plans of recently constructed high-school buildings? In what proportionate frequency are certain of the newer sorts of space-provision finding a place in these floor-plans? School officers contemplating the erection of high-school buildings often desire answers to these and related questions. This study essays a partial answer.

The facts presented are drawn from a tabulation of the kinds of space-provision made in the floor-plans of 156 high-school buildings erected during the decade 1908–17. The floor-plans were reproduced in the twenty volumes (XXXVIII–LVII) of the *American School Board Journal* for this decade and the tabulations made from these reproductions. This total number of 156 floor-plans does not include all those reproduced in the volumes designated, as some plans were omitted from consideration because the complete floor-plans were not included, some because the lettering in them was indistinct owing to reduction in size of the original in reproduction, and a few others for miscellaneous reasons.

It is advisable to state in some detail the method of tabulation that was followed. The writer first made a working list of space-provisions by examining twenty floor-plans and noting the kinds of space-provisions which had been made. The names of the 120 sorts thus found were introduced into a mimeographed form that provided space for tabulation building by building, i.e., provided for each set of floor-plans a column of blank spaces in which were to be checked the number of times each kind of space-provision had been made. Additional blank spaces were provided for other sorts of space-provisions found which would not obviously classify under the sorts already listed. The work of recording the space-provisions in the mimeographed forms was done as an exercise by twenty members of a class in high-school administration made up of advanced undergraduate and graduate students, who, notwithstanding the simplicity of the task, were given careful oral and written directions as to the mode of procedure to be followed in tabulation. To each member of the class were assigned the floor-plans in one volume of the journal named. In order to give reasonable assurance of the accuracy of the findings, after this preliminary work of tabulation had been done, the writer tested the accuracy of each student's report by checking the space-provisions reported for at least two sets of plans. When inaccuracies in the work of original tabulation were discovered, all the floor-plans in the volume assigned to the student were re-checked.

It should be stated that the entries in the mimeographed forms showed the *presence only*, *not* the *area*, of a space-provision in the floor-plan. As relatively few of the plans as reproduced include dimensions, the students were not required to compute and record the latter.

The next step in assembling the materials of the study was the final one of making the number and percentage distributions of space-provisions, as shown in the tables reproduced

here. In this final step space-provisions for furnace-rooms, fanrooms, coal-pits, etc., were excluded, because it was found that in many plans some of these were left undesignated in basement or ground floor-plans or were to be provided for in separate or attached buildings, plans of which were not reproduced. The numbers and percentages that would have resulted from a tabulation of such as were designated would not have been representative. Space-provisions for vestibules corridors, flues, etc., were also omitted from the final tabulations.

The fact that the plans were for buildings erected in communities ranging in population from a few hundred to our largest city made it possible to give some attention to the different kinds of space-provisions by *size of community*.[1] The distribution of these communities by size showed that the groups would be approximately equal in number if the population of 10,000 were used as the line of division. The final tabulations were, therefore, made for (1) communities of 10,000 population and less, (2) communities of more than 10,000, and (3) all communities. As the period under consideration has been one of rapid change for the high school, and as it was believed that this might be reflected to some extent in the space-provisions, distributions were made also according to the half-decade in which the high-school building was erected. The numbers of buildings in each of these groups may be seen by referring to the lowest row of figures in each of the tables.

THE KINDS OF SPACE-PROVISIONS

The wide range of kinds of space-provisions.—The first fact by which one is struck in glancing down the kinds of space-provision listed in the tables is their wide range. Table I, which reports the frequency of appearance of the space-provi-

[1] The word "community" is used rather than "city" or "village" because in several instances plans of township, county, or union high-school buildings were used.

TABLE I

KINDS OF SPACE-PROVISIONS AND NUMBERS AND PERCENTAGES OF FLOOR-PLANS OF HIGH SCHOOLS IN WHICH SUCH SPACE-PROVISIONS HAVE BEEN MADE

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908–12		1913–17		1908–17		1908–12		1913–17		1908–17		1908–12		1913–17		1908–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
1. Class- and recitation-rooms	40	100.0	44	100.0	84	100.0	32	100.0	39	97.5	71	98.6	72	100.0	83	98.8	155	99.4
2. Science rooms and laboratories	10	25.0	10	22.7	20	23.8	9	28.1	4	10.0	13	18.1	19	26.4	14	16.7	33	21.2
3. Elementary or general science laboratory	2	5.0	2	4.5	4	4.8	.....	.....	2	5.0	2	2.8	2	2.8	4	4.8	6	3.8
4. Botany laboratory	1	2.5	2	4.5	3	3.6	4	12.5	8	20.0	12	16.7	5	7.0	10	11.9	15	9.6
5. Greenhouse or conservatory	2	5.0	3	6.8	5	6.0	1	3.1	5	12.5	6	8.3	3	4.2	8	9.5	11	7.0
6. Agriculture laboratory	1	2.5	1	2.3	2	2.4	.....	.....	1	2.5	1	1.4	1	1.4	2	2.4	3	1.9
7. Zoölogy laboratory	1	2.5	1	2.3	2	2.4	2	6.3	6	15.0	8	11.1	3	4.2	7	8.3	10	6.4
8. Biology laboratory	8	20.0	5	11.4	13	15.5	18	56.3	18	45.0	36	50.0	26	36.1	23	27.4	49	31.4
9. Physiology laboratory	.....	.....	.....	.....	.....	.....	2	6.3	5	12.5	7	9.7	2	2.8	5	6.0	7	4.5
10. Physiography laboratory	.....	.....	2	4.5	2	2.4	10	31.3	9	22.5	19	26.4	10	13.9	11	23.1	21	13.4
11. Chemistry laboratory	19	47.5	22	50.0	41	48.8	23	71.9	26	65.0	49	69.5	42	56.3	48	57.1	90	57.7
12. Physics laboratory	17	42.5	21	47.7	38	45.2	23	71.9	23	57.5	46	63.9	40	55.6	44	52.4	84	53.8
13. Electrical laboratory	.....	.....	2	4.5	2	2.4	4	12.5	3	7.5	7	9.7	4	5.6	5	6.0	9	5.8
14. Lecture or demonstration rooms	13	32.5	22	50.0	35	41.7	20	62.5	24	60.0	44	61.1	33	45.8	46	54.8	79	50.6
15. Darkroom	6	15.0	12	27.3	18	21.4	9	28.1	13	32.5	22	30.6	15	20.9	25	29.8	40	25.6
16. Balance-room	1	2.5	.....	.....	1	1.2	3	9.4	1	2.5	4	5.6	4	5.6	1	1.2	5	3.2
17. Apparatus rooms (for science)	6	15.0	11	25.0	17	20.2	11	34.3	17	42.5	28	38.9	17	23.6	28	33.3	45	28.8
18. Manual-training room or shop	18	45.0	28	63.6	46	54.8	11	34.3	11	27.5	22	30.6	29	40.3	39	46.4	68	43.6
19. Woodworking room or shop	4	10.0	4	9.1	8	9.5	9	28.1	8	20.0	17	23.6	13	18.1	12	14.2	25	16.0
20. Bench room or shop	1	2.5	.....	.....	1	1.2	3	9.4	3	7.5	6	8.3	4	5.6	3	3.6	7	4.5
21. Cabinet-making room or shop	.....	.....	2	4.5	2	2.4	2	6.3	6	15.0	8	11.1	2	2.8	8	9.5	10	6.4
22. Carpentry room or shop	1	2.5	.....	.....	1	1.2	.....	.....	5	12.5	5	7.0	1	1.4	5	6.0	6	3.8
23. Joinery room or shop	1	2.5	.....	.....	1	1.2	3	9.4	.....	.....	3	4.2	4	5.6	.....	.....	4	2.6
24. Woodturning room or shop	.....	.....	.....	.....	.....	.....	9	28.1	7	17.5	16	22.2	9	12.5	7	8.3	16	10.3
25. Lathe room or shop	1	2.5	.....	.....	1	1.2	3	9.4	3	7.5	6	8.3	4	5.6	3	3.6	7	4.5
26. Machine-room or shop	3	7.5	4	9.1	7	8.3	10	31.3	15	37.5	25	34.7	13	18.1	19	22.6	32	20.5
27. Millroom	.....	.....	1	2.3	1	1.2	1	3.1	3	7.5	4	5.6	1	1.4	4	4.8	5	3.2
28. Forge or blacksmithing room or shop	4	10.0	4	9.1	8	9.5	13	40.7	8	20.0	21	29.2	17	23.6	12	14.2	29	18.6
29. Foundry or moulding room or shop	1	2.5	1	2.3	2	2.4	9	28.1	8	20.0	17	23.6	10	13.9	9	10.7	19	12.2
30. Forge and foundry room or shop	.....	.....	1	2.3	1	1.2	1	3.1	7	17.5	8	11.1	1	1.4	8	9.5	9	5.8
31. Sheet-metal shop	.....	.....	.....	.....	.....	.....	2	6.3	2	5.0	4	5.6	2	2.8	2	2.4	4	2.6
32. Art-metal room or shop	.....	.....	2	4.5	2	2.4	2	6.3	2	5.0	4	5.6	2	2.8	4	4.8	6	3.8

TABLE I—*Continued*

KINDS OF SPACE-PROVISIONS AND NUMBERS AND PERCENTAGES OF FLOOR-PLANS OF HIGH SCHOOLS IN WHICH SUCH SPACE-PROVISIONS HAVE BEEN MADE

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908–12		1913–17		1908–17		1908–12		1913–17		1908–17		1908–12		1913–17		1908–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
33. Plumbing room or shop			2	4.5	2	2.4			1	2.5	1	1.4			3	3.6	3	1.9
34. Stock- or lumber-room	3	7.5	14	31.8	17	20.2	10	31.3	14	35.0	24	33.3	13	18.1	28	33.3	41	26.3
35. Finishing room	1	2.5	5	11.4	6	7.1	3	9.4	7	17.5	10	13.9	4	5.6	12	14.2	16	10.3
36. Assembling and finishing room			1	2.3	1	1.2			5	12.5	5	7.0			6	7.1	6	3.8
37. Stock and finishing room			2	4.5	2	2.4			1	2.5	1	1.4			3	3.6	3	1.9
38. Tool rooms			5	11.4	5	6.0	7	21.9	5	12.5	12	16.7	7	9.7	10	11.9	17	10.9
39. Mechanical-drawing rooms	7	17.5	9	20.5	16	21.4	18	56.3	21	52.5	39	54.2	25	34.7	30	35.7	55	35.3
40. Printing-room or shop			2	4.5	2	2.4	1	3.1	3	7.5	4	5.6	1	1.4	5	6.0	6	3.8
41. Domestic-science rooms or laboratories	11	27.5	20	45.5	31	36.9	14	43.8	9	22.5	23	31.9	25	34.7	29	34.5	54	34.6
42. Sewing-room or laboratory	7	17.5	11	25.0	18	21.5	15	46.9	27	67.5	42	56.3	22	30.6	38	45.2	60	38.5
43. Dressmaking room or laboratory			1	2.3	1	1.2	2	6.3			2	2.8	2	2.8	1	1.2	3	1.9
44. Fitting-room			4	9.1	4	4.8	5	15.6	12	30.0	17	23.6	5	7.0	16	21.4	21	13.4
45. Design room or laboratory			1	2.3	1	1.2	1	3.1	2	5.0	3	4.2	1	1.4	3	3.6	4	2.6
46. Millinery room or laboratory			1	2.3	1	1.2	2	6.3	6	15.0	8	11.1	2	2.8	7	8.3	9	5.8
47. Sewing and millinery room or laboratory	1	2.5	3	6.8	4	4.8	1	3.1	2	5.0	3	4.2	2	2.8	5	6.0	7	4.5
48. Cooking-room or laboratory	8	20.0	15	34.1	23	27.4	12	37.5	31	77.5	43	57.7	20	27.8	46	54.8	66	42.3
49. Domestic or food-chemistry laboratory	1	2.5	1	2.3	2	2.4			2	5.0	2	2.8	1	1.4	3	3.6	4	2.6
50. Living (or reception) room	1	2.5	3	6.8	4	4.8	2	6.3	9	22.5	11	15.3	3	4.2	12	14.2	15	9.6
51. Dining-room	6	15.0	11	25.0	17	20.2	13	40.7	22	55.0	35	48.6	19	26.4	33	39.3	52	33.3
52. Pantry	3	7.5	3	6.8	6	7.1	7	21.9	19	47.5	26	36.1	10	13.9	22	26.2	32	20.5
53. Bedroom	1	2.5	3	6.8	4	4.8	3	9.4	11	27.5	14	19.5	4	5.6	14	16.7	18	11.5
54. Laundry			3	6.8	3	3.6	5	15.6	14	35.0	19	26.4	5	7.0	17	20.2	22	14.1
55. Bath			2	4.5	2	2.4	1	3.1	6	15.0	7	9.7	1	1.4	8	9.5	9	5.8
56. Supply-room (for domestic science)	3	7.5	8	18.2	11	13.1	9	28.1	11	27.5	20	27.8	12	16.7	19	22.6	31	19.9
57. Commercial rooms	9	22.5	10	22.7	19	22.6	13	40.7	9	22.5	22	30.6	22	30.6	19	22.6	41	26.3
58. Typewriting rooms	6	15.0	15	34.1	21	25.0	10	31.3	15	37.5	25	34.7	16	22.3	30	35.7	46	29.4
59. Stenography (or dictation rooms)	2	5.0	4	9.1	6	7.1	5	15.6	10	25.0	15	20.9	7	9.7	14	16.7	21	13.4
60. Stenography and typewriting rooms	2	5.0	2	4.5	4	4.8	2	6.3			2	2.8	4	5.6	2	2.4	6	3.8
61. Bookkeeping rooms	2	5.0	10	22.7	12	14.2	5	15.6	11	27.5	16	22.2	7	9.7	21	25.0	28	17.9
62. Banking-rooms	2	5.0	7	15.9	9	10.7	2	6.3	4	10.0	6	8.3	4	5.6	11	23.1	15	9.6

TABLE I—*Continued*

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SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908–12		1913–17		1908–17		1908–12		1913–17		1908–17		1908–12		1913–17		1908–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
63. Geography rooms (for commercial work)	1	*2.5*	1	*2.3*	2	*2.4*	1	*3.1*	1	*2.5*	2	*2.8*	2	*2.8*	2	*2.4*	4	*2.6*
64. Art rooms	1	*2.5*	2	*4.5*	3	*3.6*	2	*6.3*	7	*17.5*	9	*12.5*	3	*4.2*	9	*10.7*	12	*7.7*
65. Freehand drawing rooms	3	*7.5*	5	*11.4*	8	*9.5*	11	*34.3*	13	*32.5*	24	*33.3*	14	*19.5*	18	*21.4*	32	*20.5*
66. Modeling rooms	1	*2.5*	1	*2.3*	2	*2.4*	.....	.....	3	*7.5*	3	*4.2*	1	*1.4*	4	*4.8*	5	*3.2*
67. Exhibit hall or room (for art)	1	*2.5*	2	*4.5*	3	*3.6*	2	*6.3*	4	*10.0*	6	*8.3*	3	*4.2*	6	*7.1*	9	*5.8*
68. Music rooms	2	*5.0*	7	*15.9*	9	*10.7*	7	*21.9*	12	*30.0*	19	*26.4*	9	*12.5*	19	*22.6*	28	*17.9*
69. Library rooms	26	*65.0*	24	*54.6*	50	*59.5*	26	*81.3*	26	*65.0*	52	*72.3*	52	*72.3*	50	*59.5*	102	*65.4*
70. Library stackrooms	1	*2.5*	1	*2.3*	2	*2.4*	2	*6.3*	6	*15.0*	8	*11.1*	3	*4.2*	7	*8.3*	10	*6.4*
71. Club-, society-, or recreation-room	.....	.....	3	*6.8*	3	*3.6*	3	*9.4*	8	*20.0*	11	*15.3*	3	*4.2*	11	*23.1*	14	*8.9*
72. Gymnasiums	20	*50.0*	26	*59.1*	46	*54.8*	20	*62.5*	20	*50.0*	40	*55.6*	40	*55.6*	46	*54.8*	86	*55.1*
73. Boys' gymnasiums	.....	.....	3	*6.8*	3	*3.6*	6	*18.8*	6	*15.0*	12	*16.7*	6	*8.3*	9	*10.7*	15	*9.6*
74. Girls' gymnasiums	.....	.....	2	*4.5*	2	*2.4*	6	*18.8*	6	*15.0*	12	*16.7*	6	*8.3*	8	*9.5*	14	*8.9*
75. Running tracks	.....	.....	1	*2.3*	1	*1.2*	3	*9.4*	8	*20.0*	11	*15.3*	3	*4.2*	9	*10.7*	12	*7.7*
76. Swimming-pools (or natatoria)	.....	.....	1	*2.3*	1	*1.2*	3	*9.4*	7	*17.5*	10	*13.9*	3	*4.2*	8	*9.5*	11	*7.0*
77. Lavatories or shower-rooms	5	*12.5*	12	*27.3*	17	*20.2*	16	*50.0*	16	*40.0*	32	*44.5*	21	*29.2*	28	*33.3*	49	*31.4*
78. Dressing-rooms	2	*5.0*	6	*13.6*	8	*9.5*	14	*43.8*	4	*10.0*	18	*25.0*	16	*22.3*	10	*11.9*	26	*16.7*
79. Physical director's offices	.....	.....	2	*4.5*	2	*2.4*	4	*12.5*	11	*27.5*	15	*20.9*	4	*5.6*	13	*15.5*	17	*10.9*
80. Woman physical director's offices	.....	.....	.....	.....	.....	.....	.....	.....	5	*12.5*	5	*7.0*	.....	.....	5	*6.0*	5	*3.2*
81. Locker-rooms	1	*2.5*	3	*6.8*	4	*4.8*	2	*6.3*	9	*22.5*	11	*15.3*	3	*4.2*	12	*14.2*	15	*9.6*
82. Boys' locker-rooms	12	*30.0*	19	*43.2*	31	*36.9*	19	*59.4*	24	*60.0*	43	*57.7*	31	*43.1*	43	*51.2*	74	*47.4*
83. Girls' locker-rooms	11	*27.5*	19	*43.2*	30	*35.7*	20	*62.5*	23	*57.5*	43	*57.7*	31	*43.1*	42	*50.0*	73	*46.8*
84. Wardrobes or cloakrooms	8	*20.0*	21	*47.7*	29	*34.5*	9	*28.1*	10	*25.0*	19	*34.7*	17	*23.6*	31	*36.9*	48	*30.8*
85. Assembly rooms or auditoriums	30	*75.0*	34	*77.3*	64	*76.2*	23	*71.9*	33	*82.5*	56	*77.8*	53	*73.7*	67	*79.8*	120	*76.9*
86. Stage (in assembly room or auditorium)	19	*47.5*	30	*68.2*	49	*58.3*	19	*59.4*	28	*70.0*	47	*65.3*	38	*52.8*	58	*69.0*	96	*61.5*
87. Dressing or ante-rooms (for stage)	7	*17.5*	12	*27.3*	19	*22.6*	15	*46.9*	20	*50.0*	35	*48.6*	22	*30.6*	32	*38.1*	54	*34.6*
88. Study-rooms or halls	9	*22.5*	16	*36.4*	25	*29.8*	13	*40.7*	21	*52.5*	34	*47.2*	22	*30.6*	37	*44.0*	59	*37.8*
89. Session-rooms	1	*2.5*	.....	.....	1	*1.2*	2	*6.3*	.....	.....	2	*2.8*	3	*4.2*	.....	.....	3	*1.9*
90. Lunchrooms	5	*12.5*	10	*22.7*	15	*17.9*	10	*31.3*	13	*32.5*	23	*31.9*	15	*20.9*	23	*27.4*	38	*24.3*
91. Boys' lunchrooms	4	*10.0*	3	*6.8*	7	*8.3*	2	*6.3*	8	*20.0*	10	*13.9*	6	*8.3*	11	*23.1*	17	*10.9*
92. Girls' lunchrooms	5	*12.5*	4	*9.1*	9	*10.7*	2	*6.3*	8	*20.0*	10	*13.9*	7	*9.7*	12	*14.2*	19	*12.2*

TABLE I—*Continued*

KINDS OF SPACE-PROVISIONS AND NUMBERS AND PERCENTAGES OF FLOOR-PLANS OF HIGH SCHOOLS IN WHICH SUCH SPACE-PROVISIONS HAVE BEEN MADE

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908–12		1913–17		1908–17		1908–12		1913–17		1908–17		1908–12		1913–17		1908–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
93. Kitchens (for lunchrooms)	2	*5.0*	2	*4.5*	4	*4.8*	7	*21.9*	11	*27.5*	18	*25.0*	9	*12.5*	13	*15.5*	22	*14.1*
94. Principal's offices	32	*80.0*	36	*81.8*	68	*81.0*	31	*96.9*	36	*90.0*	67	*93.0*	63	*85.5*	72	*91.7*	135	*86.5*
95. Reception- or waiting-rooms (for principal's office)	10	*25.0*	15	*34.1*	25	*29.8*	20	*62.5*	20	*50.0*	40	*55.6*	30	*41.7*	35	*41.7*	65	*41.7*
96. Vaults	2	*5.0*	5	*11.4*	7	*8.3*	5	*15.6*	5	*12.5*	10	*13.9*	7	*9.7*	10	*11.9*	17	*10.9*
97. Assistant or vice-principal's offices	2	*5.0*	4	*9.1*	6	*7.1*	5	*15.6*	5	*12.5*	10	*13.9*	7	*9.7*	9	*10.7*	16	*10.3*
98. Teachers' offices			11	*25.0*	11	*13.1*	5	*15.6*	9	*22.5*	14	*19.5*	5	*7.0*	20	*23.8*	25	*16.0*
99. Men teachers' rooms	2	*5.0*	6	*13.6*	8	*9.5*	8	*25.0*	7	*17.5*	15	*20.9*	10	*13.9*	13	*15.5*	23	*14.7*
100. Women teachers' rest rooms	5	*12.5*	8	*18.2*	13	*15.5*	10	*31.3*	18	*45.0*	28	*38.9*	15	*20.9*	26	*31.0*	41	*25.6*
101. Teachers' rest or retiring-rooms	10	*25.0*	15	*34.1*	25	*29.8*	15	*46.9*	15	*37.5*	30	*41.7*	25	*34.7*	30	*35.7*	55	*35.3*
102. Emergency or rest rooms	1	*2.5*	9	*20.5*	10	*11.9*	6	*18.8*	12	*30.0*	18	*25.0*	7	*9.7*	21	*25.0*	28	*17.9*
103. Girls' rest rooms	1	*2.5*	7	*15.9*	8	*9.5*	1	*3.1*	1	*2.5*	2	*2.8*	2	*2.8*	8	*9.5*	10	*6.4*
104. Textbook rooms	3	*7.5*	1	*2.3*	4	*4.8*	6	*18.8*	2	*5.0*	8	*11.1*	9	*12.5*	3	*3.6*	12	*7.7*
105. Storage-rooms	12	*30.0*	22	*50.0*	34	*40.5*	19	*59.4*	26	*65.0*	45	*62.5*	31	*43.1*	48	*57.1*	79	*50.6*
106. Janitor's rooms	12	*30.0*	13	*29.5*	25	*29.8*	12	*37.5*	14	*35.0*	26	*36.1*	24	*33.3*	27	*32.1*	51	*32.7*
107. Boys' toilets	29	*72.5*	39	*88.6*	68	*81.0*	25	*78.1*	36	*90.0*	61	*84.7*	54	*75.0*	75	*89.3*	129	*82.7*
108. Girls' toilets	29	*72.5*	39	*88.6*	68	*81.0*	25	*78.1*	35	*87.5*	60	*83.3*	54	*75.0*	74	*88.1*	128	*82.0*
109. Bicycle-rooms	2	*5.0*	4	*9.1*	6	*7.1*	5	*15.6*	3	*7.5*	8	*11.1*	7	*9.7*	7	*8.3*	14	*8.9*
Number of floor-plans in group	40	.....	44	.....	84	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....

sions found at least three times in the 156 floor-plans examined, contains 109 kinds. If to these are added those appearing only once or twice in the floor-plans, of many of which mention is made in the succeeding sections of this report, this number is increased to nearly 150. And if to this total are added the many sorts of space-provision not reported upon in this study, including space for boilers, fuel, ashes, fans, engines, flues, vestibules, corridors, etc., this total would mount up easily to 200 different sorts. Truly, space-provisions in modern high-school buildings are little short of protean! By contrast, the older high-school buildings with their classrooms, study-hall, and little else were simple indeed.

Class- and recitation-rooms.—The first kind of space-provision listed in Table I, class- and recitation-rooms, is seen to be all but universal in both half-decades and in cities of all sizes. This table does not show what the original tabulations show—that classrooms are much more frequently reported than are recitation rooms; that, in fact, the former are almost always provided; that the latter are provided in almost half the plans; and that, therefore, many of the schools provide both, recognizing a distinction between them. Very few of the plans assign these classrooms to special academic subjects, e.g., to mathematics, history, etc.

Science rooms.—The more common kinds of space-provisions made for science in the floor-plans examined are shown under classifications 2–17, inclusive, in Table I. Other sorts of space-provision for science made once or twice each are rooms or laboratories for geology, sound, telegraphy, dairy, aquarium, specimens, museum, preparations, etc. The numbers and percentages given for science rooms indicate that there was a slight tendency during the decade away from unspecialized science laboratories. This is seen to be in accordance with the frequency of the percentages of the provisions for most of the special sciences to increase.

Listed in the order of their frequency of appearance in all the plans, these provisions for special sciences are as follows: chemistry, 57.7 per cent; physics, 53.8 per cent; biology, 31.4 per cent; physiography, 13.4 per cent; botany, 9.6 per cent; zoölogy, 6.4 per cent; electrical, 5.8 per cent; physiology, 4.5 per cent; general science, 3.8 per cent; agriculture 1.9 per cent. Thus, chemistry, physics, and biology are the only sciences that are given anything like frequent recognition in these plans. One is not a little surprised to find agriculture at the foot of the list, even for the high schools in communities of 10,000 and less.

Something as to the *extent* of the space-provisions for science may be learned from an examination of Table II. In the first horizontal row this table reports the numbers and percentages of plans in which no rooms were assigned specifically to science. This is more often true in the smaller than in the larger communities. It may not often mean that no rooms are set aside for use in science instruction. It is more likely that it signifies that in most instances some class- or recitation-room or rooms will be used for instruction in science. In the second row are presented the numbers and percentages of floor-plans that make provisions for undifferentiated science rooms or laboratories only. The figures are seen to be approximately equal—with a slight tendency to decrease—for the two half-decades, but unequal for high schools in the smaller and in the larger communities. In the latter, science rooms only are seldom provided. Consonant with this practice, as may be seen in the third and fourth rows, is the tendency in these larger communities to assign special rooms or laboratories to each of the sciences. These larger communities also provide a greater number of special science rooms, as may be seen by the drift of the distributions toward the lower divisions of the columns headed "Communities of more than 10,000" in the remaining horizontal rows of Table II. There was very

TABLE II

Space-Provisions For Science in the Floor-Plans of High-School Buildings

Space-Provision	Communities of 10,000 and Less						Communities of More Than 10,000						All Communities					
	1908–12		1913–17		1908–17		1908–12		1913–17		1908–17		1908–12		1913–17		1908–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
No assigned science rooms or laboratories	9	*22.5*	10	*22.7*	19	*22.6*	3	*9.4*	8	*20.0*	11	*15.3*	12	*16.7*	18	*21.4*	30	*19.2*
Science rooms or laboratories only	10	*25.0*	10	*22.7*	20	*23.8*	2	*6.3*	2	*5.0*	4	*5.6*	12	*16.7*	12	*14.2*	24	*15.4*
Special science rooms or laboratories only	19	*47.5*	24	*54.6*	43	*51.2*	21	*65.6*	28	*70.0*	49	*69.5*	40	*55.6*	52	*61.9*	92	*59.0*
Both science and special science rooms	2	*5.0*	.....	.....	2	*2.4*	6	*18.8*	2	*5.0*	8	*11.1*	8	*11.1*	2	*2.4*	10	*6.4*
1 special science room or laboratory	12	*5.0*	6	*13.6*	8	*9.5*	4	*12.5*	1	*2.5*	5	*7.0*	6	*8.3*	7	*8.3*	13	*8.3*
2 special science rooms or laboratories	11	*27.5*	10	*22.7*	21	*25.0*	5	*15.6*	8	*20.0*	13	*18.1*	16	*22.3*	18	*21.4*	34	*21.8*
3 special science rooms or laboratories	7	*17.5*	8	*18.2*	15	*17.9*	5	*15.6*	7	*17.5*	12	*16.7*	12	*16.7*	15	*17.9*	27	*17.3*
4 special science rooms or laboratories	1	*2.5*	1	*2.3*	2	*2.4*	7	*21.9*	7	*17.5*	14	*19.5*	8	*11.1*	8	*9.5*	16	*10.3*
5 special science rooms or laboratories	.....	.....	.....	.....	.....	.....	4	*12.5*	5	*12.5*	9	*12.5*	4	*5.6*	5	*6.0*	9	*5.8*
6 special science rooms or laboratories	.....	.....	1	*2.3*	1	*1.2*	1	*3.1*	1	*2.5*	2	*2.8*	1	*1.4*	2	*2.4*	3	*1.9*
7 special science rooms or laboratories	.....	.....	.....	.....	.....	.....	.....	.....	1	*2.5*	1	*1.4*	.....	.....	1	*1.2*	1	*0.6*
8 special science rooms or laboratories	.....	.....	.....	.....	.....	.....	1	*3.1*	.....	.....	1	*1.4*	1	*1.4*	.....	.....	1	*0.6*
Number of floor-plans in group	40	.....	44	.....	84	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....

little, if any, tendency to provide more of the special science rooms in the latter half than in the former half of the decade. The more common practices in "All communities" throughout the decade are the provision of 2, 3, or 4 of such special science rooms or laboratories.

Shop and allied work.—Something may be learned of the character and extent of the space-provisions for manual training and allied work (including printing) by examination of Table I, 18–40 and Table III. The following additional rooms are provided in one or two of the floor-plans examined: automobile, cement, blue-printing, dry-kiln, pottery, woodcarving, masonry, and pattern-making. The figures for "All communities" in Table III indicate that the proportion of high-school plans which made no provision whatever for this work diminished from the first to the second half-decade from an approximate third to an approximate seventh, less than one-fourth of all the 156 plans failing to make such recognition. While the proportion of plans making provision for undifferentiated manual training only increases in both the smaller and in the larger communities (Table III), the tendency is more marked in the former group. Slight qualification may be made on these interpretations owing to the fact that a few plans in both groups, although providing two or more rooms for the work, assigned them all to manual training. It is more than likely that in most cases it was planned to use one or more of these rooms for special lines of shopwork. Rooms assigned to special lines of shop- and allied work are, as is to be anticipated, much more frequently provided in the larger than in the smaller communities. Moreover, the figures for the half-decades indicate that such assignments, which are provided with only slightly greater frequency in the latter, are not on the increase in the former. The nine most commonly appearing space-provisions for the line of work under consideration, in the order of their frequency of appearance in all of the 156

TABLE III

Space-Provisions for Manual Training and Allied Work in the Floor-Plans of High-School Buildings

Space-Provision	Communities of 10,000 and Less						Communities of More Than 10,000						All Communities					
	1908–12		1913–17		1908–17		1908–12		1913–17		1908–17		1908–12		1913–17		1908–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
No assigned manual-training rooms or shops	17	*42.5*	8	*18.2*	25	*29.8*	8	*25.0*	4	*10.0*	12	*16.7*	25	*34.7*	12	*14.2*	37	*23.7*
Manual-training rooms or shops only	13	*32.5*	24	*54.6*	37	*44.0*	6	*18.8*	11	*27.5*	17	*23.6*	19	*26.4*	35	*41.7*	54	*34.6*
Special rooms or shops only	6	*15.0*	7	*15.9*	13	*15.5*	14	*43.8*	23	*57.5*	37	*51.4*	20	*27.8*	30	*35.7*	50	*32.1*
Both manual-training and special rooms or shops	4	*10.0*	5	*11.4*	9	*10.7*	4	*12.5*	2	*5.0*	6	*8.3*	8	*12.5*	7	*8.3*	15	*9.6*
1 special room or shop	3	*7.5*	7	*15.9*	10	*11.9*	1	*3.1*	4	*10.0*	5	*7.0*	4	*5.6*	11	*23.1*	15	*9.6*
2 special rooms or shops	2	*5.0*	3	*6.8*	5	*6.0*	2	*6.3*	2	*5.0*	4	*5.6*	4	*5.6*	5	*6.0*	9	*5.8*
3 special rooms or shops	3	*7.5*	1	*2.3*	4	*4.8*	2	*6.3*	3	*7.5*	5	*7.0*	5	*7.0*	4	*4.8*	9	*5.8*
4 special rooms or shops	2	*5.0*	1	*2.3*	3	*3.6*	2	*6.3*	3	*7.5*	5	*7.0*	4	*5.6*	4	*4.8*	8	*5.1*
5 special rooms or shops	.....	.....	.....	.....	.....	.....	4	*12.5*	1	*2.5*	5	*7.0*	4	*5.6*	1	*1.2*	5	*3.2*
6 special rooms or shops	.....	.....	.....	.....	.....	.....	4	*12.5*	6	*15.0*	10	*13.9*	4	*5.6*	6	*7.1*	10	*6.4*
7 special rooms or shops	.....	.....	1	*2.3*	1	*1.2*	.....	.....	3	*7.5*	3	*4.2*	.....	.....	4	*4.8*	4	*2.6*
8 special rooms or shops	.....	.....	.....	.....	.....	.....	1	*3.1*	2	*5.0*	3	*4.2*	1	*1.4*	2	*2.4*	3	*1.9*
9 special rooms or shops	.....	.....	.....	.....	.....	.....	.....	.....	1	*2.5*	1	*1.4*	.....	.....	1	*1.2*	1	*0.6*
10 or more special rooms or shops	.....	.....	2	*4.5*	2	*2.4*	2	*6.3*	.....	.....	2	*2.8*	2	*2.8*	2	*2.4*	4	*2.6*
Number of floor-plans in group	40	.....	44	.....	84	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....

plans, are as follows: manual training, 43.6 per cent; mechanical drawing, 35.3 per cent; stock- or lumber-room, 26.3 per cent; machine, 20.5 per cent; forge or blacksmithing, 18.6 per cent; woodworking, 16.0 per cent; foundry or moulding, 12.2 per cent; tool, 10.9 per cent; woodturning, 10.3 per cent. Further information on the extent of space-provision may be had by noting the number of special rooms and the frequency with which each number is assigned, as shown in the lower portions of Table III. Addition of the percentages in the extreme right-hand column will show that about a sixth of all the plans provide five or more rooms for differentiations in this field, almost all of these being in the group of larger communities.

Domestic-science and art-rooms.—The different kinds of space provision for domestic science and art are listed under classifications 41–56 in Table I. A nursing-room also is reported in one of the high-school plans examined. The figures in the first row of Table IV show clearly that the proportion of high-school buildings not making provision for work in this line is definitely on the decline, the decrease being more marked in the larger than in the smaller communities. But a comparison of these figures with those for manual training (Table III) will show that the latter is somewhat more frequently provided for in the plans. Figures in both tables show also that, although special rooms are being assigned more frequently during the second half-decade than during the first, both in the smaller and the larger communities, this tendency is more clearly marked in the latter. Consonant with this situation is the fact (Table IV) that while undifferentiated domestic-science rooms, or laboratories, were on the increase in the smaller communities, they decreased in frequency in the high schools of the larger communities. Demonstration, or practice, apartments are also being more frequently provided than formerly, although here again we find the trend more marked in the larger communities. Listed in the order of frequency,

TABLE IV

SPACE-PROVISIONS FOR DOMESTIC SCIENCE AND ART IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS

SPACE-PROVISION	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908–12		1913–17		1908–17		1908–12		1913–17		1908–17		1908–12		1913–17		1908–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
No assigned domestic-science rooms or laboratories	19	47.5	12	27.3	31	36.9	9	28.1	4	10.0	13	18.1	28	38.9	16	21.4	44	28.2
Domestic-science rooms or laboratories only	9	22.5	17	38.6	26	31.0	6	18.8	4	10.0	10	13.9	15	20.9	21	25.0	36	23.1
Special rooms or laboratories only	9	22.5	11	25.0	20	23.8	7	21.9	14	35.0	21	29.2	16	22.3	25	29.8	41	26.3
Both domestic-science and special rooms or laboratories	1	2.5	1	2.3	2	2.4	7	21.9	3	7.5	10	13.9	8	11.1	4	4.8	12	7.7
Domestic-science rooms and apartment	1	2.5	.....	.....	1	1.2	.....	.....	2	5.0	2	2.8	1	1.4	2	2.4	3	1.9
Special rooms or laboratories and apartments	1	2.5	2	4.5	3	3.6	2	6.3	12	30.0	14	19.5	3	4.2	14	16.7	17	10.9
Domestic-science rooms, special rooms, and apartments	.....	.....	1	2.3	1	1.2	1	3.1	1	2.5	2	2.8	1	1.4	2	2.4	3	1.9
Total number having apartment	2	5.0	4	9.1	6	7.1	4	12.5	15	37.5	19	26.4	6	8.3	19	22.6	25	16.0
No apartment	38	95.0	40	91.0	78	92.9	28	87.5	25	62.5	53	73.7	66	91.7	65	77.4	131	84.0
1 special room or laboratory	3	7.5	.....	.....	3	3.6	.....	.....	2	5.0	2	2.8	3	4.2	2	2.4	5	3.2
2 special rooms or laboratories	4	10.0	7	15.9	11	23.1	6	18.8	6	15.0	12	16.7	10	13.9	13	15.5	23	14.7
3 special rooms or laboratories	4	10.0	2	4.5	6	7.1	5	15.6	7	17.5	12	16.7	9	12.5	9	10.7	18	11.5
4 special rooms or laboratories	.....	.....	3	6.8	3	3.6	3	9.4	5	12.5	8	11.1	3	4.2	8	9.5	11	7.0
5 special rooms or laboratories	.....	.....	.....	.....	.....	.....	1	3.1	5	12.5	6	8.3	1	1.4	5	6.0	6	3.8
6 special rooms or laboratories	.....	.....	2	4.5	2	2.4	1	3.1	4	10.0	5	7.0	1	1.4	6	7.1	7	4.5
7 special rooms or laboratories	.....	.....	1	2.3	1	1.2	1	3.1	1	2.5	2	2.8	1	1.4	2	2.4	3	1.9
8 special rooms or laboratories	.....	.....	.....	.....	.....	.....	.....	.....	1	2.5	1	1.4	.....	.....	1	1.2	1	0.6
Number of floor-plans in group	40	.....	44	.....	84	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....

the space-provisions made in at least 10 per cent of all the 156 floor-plans are as follows: cooking-room, 42.3 per cent; sewing-room, 38.5 per cent; domestic-science room, 34.6 per cent; dining-room, 33.3 per cent; pantry, 20.5 per cent; supply-room, 19.9 per cent; laundry, 14.1 per cent; fitting-room, 13.4 per cent; bedroom, 11.5 per cent. As a domestic-science room, or laboratory, very frequently signifies a cooking laboratory, it may be seen that assignment of rooms for this special line of work is made with much greater frequency than for any other of the group. The lower portion of Table IV, which reports the numbers of special rooms and the numbers and percentages of buildings in which such numbers of rooms are assigned, shows that the number of special rooms for this work is increasing in communities both large and small, but more rapidly in the latter. Less than a ninth of all of the 156 plans provide five or more special rooms.

Commercial-rooms.—Classifications 57–63 of Table I and Table V set forth the main findings as to kinds and extent of space-provisions for commercial work in the floor-plans examined. In addition to the classifications listed, rooms for business practice, model offices, museums, and real estate are provided in one or two of the floor-plans examined. The first horizontal row of figures in Table V shows a very large proportion of high-school floor-plans in which no rooms are assigned to commercial work. This proportion is much larger than for shopwork and domestic science. It is likely that in a number of the high schools in which no such provisions are made it is planned to use regular classrooms for this work, and that, therefore, the figures here given do not represent the actual facts as to space-provision for the activities in this line. The tables show that undifferentiated and single commercial rooms are not to any notable extent increasing in prevalence, but that, on the other hand, special rooms for special subjects in this field are on the increase, particularly

TABLE V

SPACE-PROVISIONS FOR COMMERCIAL WORK IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS

SPACE-PROVISION	COMMUNITIES OF 10,000 AND LESS						COMMUNITIES OF MORE THAN 10,000						ALL COMMUNITIES					
	1908–12		1913–17		1908–17		1908–12		1913–17		1908–17		1908–12		1913–17		1908–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
No assigned commercial rooms	28	*70.0*	23	*52.3*	51	*60.7*	12	*37.5*	20	*50.0*	32	*44.5*	40	*55.6*	43	*51.2*	83	*53.2*
Single commercial rooms only	1	*2.5*	4	*9.1*	5	*6.0*	3	*9.4*	2	*5.0*	5	*7.0*	4	*5.6*	6	*7.1*	10	*6.4*
More than one unspecialized commercial room	1	*2.5*	.....	.....	1	*1.2*	4	*12.5*	.....	.....	4	*5.6*	5	*7.0*	.....	.....	5	*3.2*
Special rooms only	5	*12.5*	11	*25.0*	16	*21.4*	7	*21.9*	11	*27.5*	18	*25.0*	12	*16.7*	22	*26.2*	34	*21.8*
Both commercial and special rooms	5	*12.5*	6	*13.6*	11	*23.1*	6	*18.8*	7	*17.5*	13	*18.1*	11	*15.3*	13	*15.5*	24	*15.4*
1 special room	4	*10.0*	3	*6.8*	7	*8.3*	4	*12.5*	6	*15.0*	10	*13.9*	8	*11.1*	9	*10.7*	17	*10.9*
2 special rooms	5	*12.5*	8	*18.2*	13	*15.5*	5	*15.6*	4	*10.0*	9	*12.5*	10	*13.9*	12	*14.2*	22	*14.1*
3 special rooms	1	*2.5*	4	*9.1*	5	*6.0*	4	*12.5*	3	*7.5*	7	*9.7*	5	*7.0*	7	*8.3*	12	*7.7*
4 special rooms	.....	.....	1	*2.3*	1	*1.2*	.....	.....	5	*12.5*	5	*7.0*	.....	.....	6	*7.1*	6	*3.8*
5 special rooms	.....	.....	1	*2.3*	1	*1.2*	.....	.....	.....	.....	.....	.....	.....	.....	1	*1.2*	1	*0.6*
Number of floor-plans in group	40	.....	44	.....	84	.....	32	.....	40	.....	72	.....	72	.....	84	.....	156	.....

in the smaller communities. The space-provisions for commercial work in the order of frequency of appearance are as follows: typewriting, 29.4 per cent; commercial, 26.3 per cent; bookkeeping, 17.9 per cent; stenography, 13.4 per cent; banking, 9.6 per cent; stenography and typewriting, 3.8 per cent; geography, 2.6 per cent. The lower portion of Table V reports the numbers of special rooms and the numbers and percentages

TABLE VI

SPACE-PROVISIONS FOR ART IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS

SPACE-PROVISION FOR	COMMUNITIES OF 10,000 AND LESS				COMMUNITIES OF MORE THAN 10,000			
	1908–12		1913–17		1908–12		1913–17	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Art	7	*17.5*	11	*25.0*	15	*46.9*	23	*57.5*
Number of floor-plans in group	40	.....	44	.....	32	.....	40	.....

of building plans in which such numbers of rooms are assigned. These figures show that the number of special rooms is increasing. The number of special rooms, however, is not as large as for manual training and domestic science, as may be seen by a comparison of the figures in Table V with those in Tables III and IV.

Art-rooms.—Facts concerning the main sorts of space-provision for art are presented under classifications 64–67 of Table I and in Table VI. In addition to the space-provisions listed in Table I, provision is made also in one or two floor-plans for arts and crafts, crafts, water-color, modeling, and book-binding. The two tables to which reference has been made show that such space-provisions are on the increase and that they are more commonly made in the larger than in the

smaller communities. Rooms for freehand drawing are much more frequently provided than other special rooms. A fact not shown in the tables which is deserving of attention is that it is very seldom that more than one such room is provided, the tendency to provide more being more marked, of course, in the larger than in the smaller communities.

Music-rooms.—Special rooms for music (I, 68) are being provided with increasing frequency in both large and small communities, but are more prevalent in the latter. They are still far from common.

Library-rooms.—Space-provisions for the library (I, 69–70) are made in approximately two-thirds of all floor-plans examined. Probably the small decrease in percentage from the first to the second half-decade has little sinister significance. Not many high schools are providing both stackrooms and reading-rooms.

Club-, society-, and recreation-rooms.—Although still far from common, these space-provisions are being made with increasing frequency (I, 71).

Gymnasiums and allied space-provisions.—When the percentages for both common and boys' and girls' gymnasiums (I, 72–74) are added, we find almost two-thirds of the floor-plans making provision for them. There is not a marked difference between the percentages for the smaller and the larger communities. This space-provision was scarcely more frequently made in the second half-decade than in the first. Running-tracks and swimming-pools (I, 75–76) are not common, but show some tendency to increase. Shower-rooms (I, 77) show an increase in frequency in the smaller communities, but the proportion of high schools in these communities providing them is, even during the second half-decade, less than for the larger communities. Approximately a third of all the plans make provision for them. Dressing-rooms are not as often provided as we should anticipate were there not

such a large percentage of locker-rooms for the two sexes (I, 82–83). Offices for physical directors do not seem to school authorities as yet to have attained the place of a necessity except in some of the larger communities.

Locker- and cloak-rooms.—Locker-rooms or cloakrooms (I, 81–84), or both, are provided in most high-school buildings. The former increased much more in proportional frequency during the two half-decades in the smaller than in the larger communities. Common locker-rooms are not nearly as often provided as are separate locker-rooms for the sexes. This situation is somewhat accentuated by the presence of the locker-rooms in the neighborhood of the gymnasiums. A few plans provide for both common and boys' and girls' locker-rooms. The facts as to the space-provisions for lockers would have been more useful had it been possible to distinguish between those intended for general use by the student and those to be used in connection with some special activity, as physical training, manual arts, etc.

Auditoriums, assembly, study, and session rooms.—More than three-fourths of all the plans examined provide either an auditorium or an assembly room (I, 85), this proportion being almost uniform for smaller and larger communities in both half-decades. Stages and dressing-rooms (I, 86–87) for these are more common in the high schools of the larger communities and are on the increase in both smaller and larger communities. Study-halls, or rooms, (I, 88) are becoming more common. It is pertinent to mention here a fact which does not appear in the table, that, when study-halls, or -rooms, are provided, they are almost always (in 50 out of 59 instances) accompanied by a provision in the same plan for auditoriums or assembly rooms and are two to several in number.

Lunchrooms.—Common and boys' and girls' lunchrooms (I, 90–92) appear in slightly more than a third of all plans examined, the common type being provided in approximately

twice as many plans as the segregated type. High schools in smaller communities do not as frequently provide lunchrooms as do those in the larger ones. Furthermore, kitchens in connection with these lunchrooms are seldom provided in high schools of the former group, but are provided in almost a fourth of the latter. A fact not appearing in the table is that two of the high schools also provide an instructors' lunchroom.

Office-rooms.—Although most building plans provide for a principal's office (I, 94), a small proportion fail to do so. This failure is more marked in the smaller communities. Approximately half of the high schools in the larger cities also provide reception or waiting-rooms (I, 95); in the smaller cities this proportion drops to somewhat less than a third of all high schools. Vaults (I, 96) for the principal's office and offices for assistant principals (I, 97) and for teachers (I, 98) are not provided in a large proportion of buildings, but all three are more common in the larger than in the smaller communities.

Rest and emergency rooms.—Classifications 99–103 of Table I present the fact sconcerning the provision of rest and emergency rooms. Because there is some confusion as to the meaning of the terms "rest room" and "emergency room," it has been difficult to make a fully satisfactory classification of the several sorts of space-provision that fall in these categories. In some plans the same room was designated as an emergency and rest room. The figures, however, show a tendency—somewhat more marked for women teachers' rest rooms and emergency and rest rooms than for the other classifications—toward an increase of recognition of this group of space-provisions. Rooms of one or more of the kinds named have been provided in the plans of approximately three-fourths of all the floor-plans examined.

Other space-provisions.—Textbook rooms (I, 104) are not often given a place; no doubt this room will not often be assigned where the system does not supply the textbooks to

students. Storage-rooms (I, 105) increased in frequency during the decade and were provided in slightly more than half the plans examined. The janitor has a room (I, 106) in almost a third of the buildings. Toilets (I, 107–8) are not quite as nearly universal in the plans as is to be desired. The deficiency is to be explained in part by their omission from the plans in some of the smaller and even larger communities where no facilities for sewage disposal are at hand. In a small percentage of instances toilet accommodations of an adequate sort are provided in annexes. A small proportion of plans set aside space for bicycle-rooms (I, 109).

Relative frequency of the space-provisions.—Before leaving consideration of particular space-provisions attention will be directed to their relative frequency, which is not readily apparent in Table I. In order to emphasize relative frequency, the kinds of space-provision have been grouped according as they fall in decreasing percentage classifications and ranked in the order of this decreasing frequency in all the 156 floor-plans. The result is Table VII. As there are many kinds of space-provision appearing with identical percentages of frequency, the number of ranks is only about half the number of kinds of space-provision listed in Table I. A glance at the upper portion of this distribution informs us that only 12 of all the 109 sorts of space-provision are made in more than 50 per cent of the floor-plans. This is to say that a majority at least of those who have authorized the construction of the 156 high-school buildings whose plans were examined for this study regard the following as minimum essentials of such buildings: class- or recitation-rooms, a chemical and physical laboratory, with a lecture or demonstration room for these sciences, an assembly room or auditorium with a stage for same, a library room, a gymnasium, an office for the principal, a room for general storage, and boys' and girls' toilets. Examination of the first horizontal row in each of the supplementary

Tables III and IV will show that to this meager list may be added some provision for manual training and domestic science. Examination of the percentages of Table I by size of community will show that for the larger communities we may also add a laboratory for biology, a mechanical-drawing room, boys' and girls' locker-rooms, and a reception- or waiting-room to the principal's office. On the other hand, if we canvass the percentages of this table for the smaller communities, we note that from the minimal list must be subtracted the space for separate chemical and physical laboratories, the lecture or demonstration room for these two sciences, and the room for storage. It is of interest to note the very wide range of kinds of space-provision not regarded as essential in a majority of the com munities. Indeed, the reader can hardly fail to be surprised at the low ranking and percentage found for many of the kinds of space-provision in the lower portions of Table VII.

TABLE VII

SPACE-PROVISIONS IN THE FLOOR-PLANS OF HIGH-SCHOOL BUILDINGS IN THE ORDER OF FREQUENCY OF APPEARANCE

90–100 per cent:

1. Class- and recitation-rooms, 99.4

80–90 per cent:

2. Principal's office, 86.5
3. Boys' toilets, 82.7
4. Girls' toilets, 82.0

70–80 per cent:

5. Assembly room or auditorium, 76.9

60–70 per cent:

6. Library room, 65.4
7. Stage (in assembly room or auditorium), 61.5

50–60 per cent:

8. Chemistry laboratory, 57.7
9. Gymnasium, 55.1
10. Physics laboratory, 53.8
11. Lecture or demonstration room (for science), 50.6
11. Storage-room, 50.6

40–50 per cent:

12. Boys' locker-room, 47.4
13. Girls' locker-room, 46.8
14. Manual-training room or shop, 43.6
15. Cooking-room or laboratory, 42.3
16. Reception- or waiting-room (to principal's office), 41.7

30–40 per cent:

17. Sewing-room or laboratory, 38.5
18. Study-rooms or halls, 37.8
19. Mechanical-drawing or draughting room, 35.3
19. Teachers' rest- or retiring-room, 35.3
20. Domestic-science room or laboratory, 34.6
21. Dressing- or ante-rooms (for stage in auditoriums), 34.6
22. Dining-room (for home economics), 33.3
23. Janitor's room, 32.7
24. Biology laboratory, 31.4
24. Lavatories or shower-rooms, 31.4
25. Wardrobe or cloakroom, 30.8

20–30 per cent:

26. Typewriting room, 29.4
27. Apparatus room (for science), 28.8
28. Commercial room, 26.3
28. Stock- or lumber-room (for manual training), 26.3
29. Women teachers' restroom, 25.6
29. Darkroom (for science), 25.6
30. Lunchroom, 24.3
31. Science room or laboratory, 21.2
32. Freehand drawing room, 20.5
32. Pantry (for home economics), 20.5
32. Machine room or shop, 20.5

10–20 per cent:

33. Supply-room (for home economics), 19.9
34. Forge or blacksmithing room or shop, 18.6
35. Bookkeeping room, 17.9
35. Music room, 17.9
35. Emergency or rest room, 17.9
36. Dressing-rooms (for gymnasium), 16.7
37. Teachers' offices, 16.0
37. Woodworking room or shop, 16.0
38. Men teachers' room, 14.7

39. Kitchen (for lunchroom), 14.1
39. Laundry (for home economics), 14.1
40. Stenography or dictation room, 13.4
40. Fitting-room (for home economics), 13.4
40. Physiography laboratory, 13.4
41. Foundry or moulding room or shop, 12.2
41. Girls' lunchroom, 12.2
42. Bedroom (for home economics), 11.5
43. Tool room, 10.9
43. Physical director's office, 10.9
43. Boys' lunchroom, 10.9
43. Vault (in principal's office), 10.9
44. Woodturning room or shop, 10.3
44. Finishing room, 10.3
44. Assistant or vice-principal's office, 10.3

5–10 per cent:

45. Botany laboratory, 9.6
45. Living- or reception-room (for home economics), 9.6
45. Banking-room, 9.6
45. Boys' gymnasium, 9.6
45. Locker-room, 9.6
46. Club-, society-, or recreation-room, 8.9
46. Girls' gymnasium, 8.9
46. Bicycle-room, 8.9
47. Running-track, 7.7
47. Art room, 7.7
47. Textbook room, 7.7
48. Greenhouse or conservatory, 7.0
48. Swimming-pool or natatorium, 7.0
49. Zoölogy laboratory, 6.4
49. Cabinet-making room or shop, 6.4
49. Library stackroom, 6.4
49. Girls' restroom, 6.4
50. Electrical laboratory, 5.8
50. Forge and foundry room or shop, 5.8
50. Millinery room or laboratory, 5.8
50. Bathroom (for home economics), 5.8
50. Exhibit hall or room (for art), 5.8

1.9–5 per cent:

51. Physiology laboratory, 4.5

51. Benchroom or shop, 4.5
51. Lathe room or shop, 4.5
51. Sewing- and millinery-room or laboratory, 4.5
52. Elementary or general science room or laboratory, 3.8
52. Carpentry room or shop, 3.8
52. Art-metal room or shop, 3.8
52. Printing-room or shop, 3.8
52. Stenography and typewriting room, 3.8
53. Balance-room, 3.2
53. Millroom, 3.2
53. Modeling-room, 3.2
53. Woman physical director's office, 3.2
54. Joinery room or shop, 2.6
54. Sheet-metal shop, 2.6
54. Design room or laboratory (for home economics), 2.6
54. Domestic or food-chemistry laboratory, 2.6
54. Geography room (for commercial work), 2.6
55. Agriculture laboratory, 1.9
55. Plumbing-room or shop, 1.9
55. Stock- and finishing-room, 1.9
55. Dressmaking-room or laboratory, 1.9
55. Session rooms, 1.9

SIGNIFICANCE AND UTILITY OF THE FINDINGS

Certain conclusions of a more general character may be drawn from the specific facts and findings of this study. The examination of the space-provisions in the plans of better high-school buildings erected in this country during two recent and successive half-decades indicates a marked tendency toward the multiplication of facilities for specialization, differentiation, and enrichment of the work of the high-school student. This is illustrated by the movement toward special rooms for the special sciences; by the trend toward the assignment of special rooms for differentiations of the three most common vocational offerings in the high school, viz., shop and allied work, domestic science and art, and commercial work; and by the more frequent provision of space for art,

music, libraries, extra-curricular activities, gymnasiums, etc. It has been frequently noted in this study that—and this is a matter also of common observation—although most of these space-provisions are on the increase in both the smaller and the larger communities, the former are rather commonly lagging behind the latter in the percentages of such recognition. There is a measure of inevitability in this situation. This is owing in part to the financial problem that the smaller communities would need to face were they to attempt to provide buildings allowing for all the specializations and enrichments finding a place in the high schools of the larger communities. But it must also be in large part owing to the smaller enrollments in the high schools and in the vocational make-up of the smaller communities and the consequent relative absence of a need for such a wide range of specializations. We have noted also that in the majority of communities the minimum essentials of a high-school building are considered to be class- and recitation-rooms, chemical and physical laboratories, with a lecture and demonstration room for these sciences, an assembly room or auditorium, with a stage for same, a library room, a gymnasium, an office for the principal, a room for general storage, and boys' and girls' toilets. Although to this minimal list some kinds of space-provision are added in the larger communities, there is a tendency to subtract from it in the smaller communities.

A final word may be said on the uses to which the findings of a study of the kind here reported may be put. It seems to the writer that school authorities contemplating the erection of a high-school building will do well to have before them such a fairly complete list of space-provisions as a study of this kind provides. They may advisedly give some consideration also to the proportion of buildings of recent construction in which each of the many sorts of space-provision has been made. They should without question make themselves aware of the

trend in the kinds of space-provisions in both small and large communities. Possibly they may go so far as to be sure to include in their plans provisions for what seem to be regarded in a majority of the plans as the minimum essentials of a high-school building. But to accept blindly the facts presented as the determiners of the kinds and extent of space-provisions to be made in a building would endanger the adaptability of the building whose erection is contemplated to the needs and financial ability of the community. Violation of the criterion of adaptability to local needs would result, for instance, in most of the small communities whose school authorities would determine on the basis of the findings of this study that, because only 2.4 per cent of all high-school buildings in communities with a population of 10,000 and less provide space for instruction in agriculture, no space should be set aside for instruction in this line in the buildings whose plans they are to approve. Violation of the criterion of financial ability would in most cases result from a decision of the authorities in a small community to insist upon making all the sorts of space-provision at all frequently found in this investigation. It is obvious that such a study cannot free those in authority from the duty of giving careful thought to the particular problem before them. It should, however, result in more effective thinking on that problem.

A COMMITTEE ON RESULTS

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School organization is for the most part of such a type that it emphasizes the giving of instruction. There is little or no energy set aside in the ordinary school for the checking of results. Many teachers who are aware of the demand for careful tests and are acquainted with the theory of such tests are not encouraged under existing conditions to make tests in their own classes. Furthermore, if some energetic teacher undertakes tests in his field, the results are not as valuable as they might be if they could be made part of a general co-operative plan. Sometimes two teachers in a school, or two departments, are working on problems having many elements in common, without either having any knowledge of the investigations of the other. If their results had been available to all the members of the faculty, it might have been possible to establish a type of co-operation which would have eliminated useless repetition, and would have made all the work much more significant. Hence, some agency in a school should be in contact with every educational experiment going on. From this co-ordinating agency all the teachers may receive advice or directions as to scientific procedure, and through it, results may be made available to the teachers of the school.

In some cases this centralizing agency will doubtless be the principal. Indeed, it is undoubtedly one of the wisest forms of supervision that can be set up when the principal induces each department to test its own results. But even the principal requires co-operation in work of this kind if it is to

become general in a school. The following paper is a description of the work of a committee created in the summer of 1918 in the University High School of the University of Chicago, known as a Committee on Results, and charged with the responsibility of stimulating testing throughout the school and of co-ordinating such work done by the various departments.

The University of Chicago High School is strictly a laboratory school and during the last ten years departmental tests have gradually increased. Every department is now engaged in one or several educational experiments, and the need of some central organization of all this work became very apparent. This led the faculty to create the committee. The chairman was appointed by the faculty, and it was left to him to determine the size of the committee and to select the members. The committee was to find its own field of work. A fund was created to cover the expenses of all work of a purely clerical character, such as making of graphs, typewriting, and mimeographing. There was also a special fund to purchase materials needed to carry on the work.

At the beginning of the school year the organization of the committee was complete. The members had been chosen with a view toward securing representatives from all divisions of the school's work. The principal of the school volunteered to attend all of the meetings. In fact, these meetings were open to all teachers. They were invited to come and urged to take part in the discussions.

The committee was found to be a convenient agency for carrying on several types of work during the year. Most of this was closely related to the testing going on in the school. For example, investigations were made as to the practices of the faculty in giving tests, such as the frequency with which tests were given by the teachers and departments, the amount of time used in reviewing for the tests, the length of time needed to give the tests, the best schedule for giving final

semester examinations, and the value assigned to them in deciding the final grade the pupil is to receive for the course. In this paper only one phase of the work is to be described, the committee's activity in the making of tests and measuring results.

From the beginning, much of the committee's time was taken up in assisting teachers in the technique of testing. To make every teacher in the school familiar with the essentials of scientific measurement, a member of the faculty of the College of Education was invited to give several lectures on this subject. These lectures were not allowed to conflict with, or to displace, regular faculty meetings. They were well attended and were very helpful, especially to those who were not well acquainted with the literature on testing.

Another step in the same direction was to make every teacher familiar with all the tests in his field. For this purpose one member of each department was appointed to work up the bibliography of testing in that field. He was asked to make a report containing the name of the author, title, name and address of publisher, or source of each test, a copy and brief description of every test, and a summary classifying and comparing all the tests with reference to the principal characteristics and values. These reports were mimeographed and made available to all of the teachers. At the present time the committee has received complete reports from the departments of science, mathematics, Latin, social science, English, and home economics.

During the progress of the various experiments going on in the school, the committee gave assistance and information as to the technique of testing and measuring wherever it was needed. Often the experience with one problem suggested a way of overcoming similar difficulties arising in another field. Indeed, many of the questions which arose were common, and because of its general experience, the committee was often

able to save the time and effort of the teachers. When an experiment reached the point where the work to be done was mainly of a clerical nature, it was turned over to some graduate student of the College of Education who was paid for his services.

The fact that the formulation of a problem and the planning of an experiment in one department frequently indicated a mode of attack to another department suggested to the committee the idea of a special open meeting for the purpose of hearing a detailed report. For example, the English Department explained the nature of the tests given to measure a few of the concrete aims of the teaching of freshman English, the use made of the results in regrouping the first-year classes, and the changes in instruction intended to give these groups such teaching as was most suitable to their needs. It was further shown how these tests had raised a number of new and interesting problems.

The aim and purposes of high-school instruction are not always clearly defined. Through the efforts of the committee to help some teachers to formulate concrete aims, these teachers were led to undertake the problem of measuring the extent to which these aims were accomplished with the pupils.

Following the definition of aims comes the making of suitable tests. Here again the broad experience of the committee enabled it to render valuable assistance. It was competent to help in the working out of uniform instructions to be given to the pupils taking these tests, in developing systems of marking to facilitate the grading of the papers, in interpreting the meaning of the results, and in making graphical representation of these results. Frequently this helped the progress of the experiment, or saved it from the fate of being abandoned. Occasionally the committee was able to give assistance when the complexity of the problem seemed very great, or to point out to the teacher new and definite problems. The latter really has been one of the important outcomes of all testing.

The tests furnished material to be used as a study of the results of teaching and led to improvement of methods of attaining better results in the future.

When a school undertakes to test the results in one or even all of the departments, there is danger of overburdening the pupils with a large number of reviews and with extra work. This caused the committee to study the question of regulating the testing done in the school. Certain days were reserved for tests given at regular intervals by some departments. The other departments were asked to notify the office if they wished to give a test. Notices announcing the test were then sent out from the office to all of the teachers. This removed the possibility that the pupils would have to prepare for more than one test on the same day.

At the end of the school year the committee asked each department to make a careful report on the work of the past year. These reports were to contain at least the following points: (1) A bibliography of the standardized tests in the subject, as outlined above. (2) A report on exactly what the department had done in testing during the year. This includes samples and description of the tests actually performed; a statement of the number of tests given to special classes, departmentally, or comparing our own pupils with other schools; a statement of the aims and purposes of the tests; a statement of some or all of the results; a discussion of the usefulness of these tests; future developments and changes to be made. (3) A description of the major problems on which the department worked during the year and of their present state of development.

The committee gave considerable help in the making of these reports. At this time several departments have already sent in complete reports, and others have made preliminary reports for the purpose of first getting the criticism or approval of the committee. These reports will be available to the

teachers at the beginning of the new school year so that every department will be able to take up the work where it was left at the close of this year.

In the space allowed for this article it will be possible to make only such brief summaries of these reports as are given below. It is hoped that ultimately all of the material will be ready for publication. Some of it will doubtless be published in the near future.

MATHEMATICS

The Department of Mathematics has made a careful analysis of the details of the subject-matter used in the first three years. The tests contain problems typical of all the phases of the work. A scheme was devised for dividing the solution of each problem into its component parts and careful records were kept showing to what extent the pupils succeeded. The study has led to the following results: the development of definite principles for the making of suitable tests for the purpose of diagnosis; detailed information to be used to improve instruction; the determination of a large number of errors and difficulties; a study to determine the relative order of difficulty of the processes, and a study of the varying difficulty of the same process in different situations; the development of a technique to overcome them, and to remove unnecessary difficulties; the development of keys to be used in scoring the tests; a method of determining uniform grades; an improvement in neatness and accuracy of all the written work done by the pupils. Next year the Department will use the results of these tests to improve the method of teaching the subject, as detailed records for the work of each chapter are available.

HISTORY

The tests given in the History Department have been designed in large part to assist the instructor in grading pupils and in evaluating methods of instruction. In modern history

classes an attempt was made to discover the relative difficulties of different questions with a view toward determining what topics should be taught, the materials to be used, and the attainments to be secured by the pupils.

FRENCH

The French Department, which is much interested in the question of teaching pronunciation by the phonetic method, originated a pronunciation test with which to control in a very definite way the results obtained. French pronunciation was resolved into its primary factors and the principles which are contained with these factors were definitely set down. Then a model sentence was taken which, when read in various ways, would show whether the student could apply these principles accurately. As the pupil read, each defect was recorded on a specially prepared score-card. Certain new and surprising facts were definitely established, namely, that the previous judgment of pronunciation was very inaccurate and that in the teaching of pronunciation, the emphasis was not properly placed. Furthermore, the uniform basis upon which the results were judged proved to be very satisfactory to teachers and students.

GENERAL SCIENCE

Factual tests and terminology completion tests have been carried on in general science throughout the year. These tests are similar to those suggested by Starch's test for physics. Here, however, instead of emphasizing principles of science, the tests have attempted to measure the acquisition by pupils of science terms and facts. Reasoning completion tests were also attempted but found to be unsatisfactory in their present form.

With the completion of each unit of work in the science course the factual completion tests were given. The results of these tests were:

1. An economical review of important phases of the course.
2. A stimulation of competition between pupils and classes.
3. An acquisition, on the part of the teachers, of the definite knowledge needed to modify our methods of teaching and especially to emphasize meanings of new terms met in the course.
4. Finally, an appreciation of the value of such or other tests in all science classes and a preliminary step in the formulation of better tests.

Next year it is planned to give a series of tests to all classes in the Department. These tests are being prepared at present. It is the aim to make the tests specific to each unit of work rather than make one test for a complete year's course in any science. However, it is possible that such a general test may be the outgrowth of the specific tests.

MANUAL TRAINING

Very significant improvement of testing work carried forward by the Manual Training Department during the year was conducted in connection with a class in blacksmithing. This work centered around what has usually been termed the speed test and was intended to develop material helpful along two specific lines: first, the development of a standard scale for rating students in this department; second, improvement in instruction and execution growing out of performance that the maximum speed consistent with desirable methods of work might be attained. As a result of these tests a complete record of the progress of each student in the course was accumulated during the year.

These speed tests were given at the end of the period devoted to a given unit of constructive work. For example, in connection with the making of center punches, the work was carefully demonstrated for the sake of analysis and the establishment of good form. This was followed by execution

either in single unit or duplicate by the members of the group. After considerable practice had been given in this connection, the instructor again demonstrated the process with the point of view of eliminating waste motion and of reducing the time to that approaching trade practice. The performance and time of the instruction in this demonstration became an item of record and a standard of trade performance. All members of the group then produced this unit of work under time and controlled conditions.

As a result of this speed test performance, it was found that there was a marked improvement in both speed and quality of work. Individual students whose performance was carried forward on a relatively low level under ordinary class conditions showed marked improvement when stimulated to speed up production, all of which goes to show that much of the shop practice carried forward in our school laboratories has not been keyed up to the basis of functional performance, in many cases much more readily attainable than that heretofore thought desirable because of certain conditions growing out of the school organization.

LATIN

The Latin Department has given a series of tests in all the courses of the Department, once a month in the first- and second-year classes, and once in six weeks in the third- and fourth-year classes.

The aim has been, first, to determine definite measures which could be applied with a large degree of accuracy in determining the standing of pupils; secondly, to determine whether there was need for change of emphasis in teaching either in the Department as a whole or in any recitation section; thirdly, to discover the needs of individual pupils, and so make possible the most effective administration of the work of the study class. The more formal first-year tests were

made up, either wholly or in part, of sentences for translation from English into Latin. The errors found in the papers written by pupils were listed according to grammatical relation involved. In the second year, in addition to translation and the writing of Latin, a certain amount of syntactical classification of words was tested. The difficulties of individual pupils were determined as being concerned primarily with translation, syntax, or the writing of Latin.

As a result of this general systematic testing, teaching has been made more definite. Pupils have been more insistently made to see the specific type of error which appeared in their work and to have a better understanding of sentence structure. In the criticisms of incorrect English usage by members of the class, they more readily recognize and name the exact character of the error.

Through the courtesy of the English Department, the Latin Department has been able to undertake a series of special tests, the purpose of which is to determine how far the pupil's knowledge of Latin words aids him in understanding English words derived from, or etymologically related to, these words. Thus, the Department hopes to find the best means of securing for the pupil the greatest possible immediate, practical value from the study of Latin.

ENGLISH

The English Department during the first semester 1918–19 undertook a series of experiments in ninth-grade English, the primary purposes of which may be stated as follows: first, the grouping of pupils into sections composed of children at approximately the same level of language attainments; secondly, the differentiation of instruction in accordance with these varying language needs; thirdly, the substituting of instruction in rapid reading in content material for the intensive study of a few great masterpieces.

The pupils were tested in two general phases of language attainment. The first series of tests, designated as "Reading Tests," included devices for determining the rates at which pupils read and the extent to which they understood the content read. The second series, designated as "Language Tests," was designed to determine the attainment of the pupils in the mechanical aspects of written expression.

At the end of the first week, pupils were redistributed as the result of the tests into six groups, each composed of pupils of approximately the same level of language attainment. The three sections which met in the 9:00 o'clock classes were distributed solely on the basis of the language tests. Three classes which met at the 11:00 o'clock period were assigned solely on the basis of the reading tests, rate, and comprehension. The administrative device, placing three reading sections at one hour, and three language sections at the same hours, was necessary in order to shift pupils back and forth as the time progressed and to regroup pupils later on the basis of progress made during the first semester.

At the end of the semester's work the entire freshman class was given two series of tests which so far as possible were designed to be equivalent to the tests given in October. The purpose was to determine what changes had taken place in the accomplishments of the pupils as a result of the differentiated instruction which had been given. Three tests of the rate of silent reading were used, similar in character to the tests for rate which had been given at the beginning of the semester.

The results showed that the sophomore class read in thirty minutes a total of 634 pages of the material included in the first rate tests and that they read in the same length of time a total of 651 pages of the material given in the second rate test. Only 17 more pages were read of the material for the second test than for the first test. Hence it may be concluded that

the selections included in each of the two tests were approximately equal in difficulty. Three comprehension tests were given at the end of the semester, comparable in character and difficulty to those which were given first.

HOME ECONOMICS

The Department of Home Economics has made a statistical study of the present status of this subject in the public schools with a view toward offering constructive suggestions concerning its improvement. A summary has been made of the main functions of home economics and of its general and specific purposes. Finally, a series of content and reasoning tests has been worked out for the purpose of determining when to place emphasis in teaching. The greatest usefulness of these tests will probably be in the possessing of a critical attitude toward what is now being taught.

Another type of tests designed by the Department aims to measure skill in machine sewing. Since the tests were given in a number of schools, detailed directions for giving the tests have been worked out.

GEOMETRY BY ANALYSIS

H. O. BARNES
Head of Department of Mathematics, Springfield High School,
Springfield, Illinois

As an observer of geometry work in high school and as a teacher of the subject, I became convinced a few years ago that the method commonly used fails to induce the pupils to study constructively, and that this method also fails to lead pupils to organize and express the results of this study clearly.

I noticed the large number of pupils in every geometry class who fail to get the real significance of the argument, and therefore really get nothing from the study. I also noticed a smaller number who master the set demonstration so easily that they are idle while the majority of the class are struggling with the problem. I noticed also the large group coming between these two extremes who master the work by dint of application to the set demonstration in which the argument is gone over repeatedly until fairly fixed.

I believe this is a fair statement of a situation that exists in most of the geometry classes in our high schools. It is a situation that was particularly depressing to me in my own classes, and I had the feeling that, while many of my pupils could demonstrate the theorems discussed in the classroom, few of them could apply this same procedure to new work of like grade. I think this feeling is common to teachers of the subject.

As I see it, geometry instruction should lead pupils to develop, each for himself, a large part of the demonstration, taking into account individual differences, in order to bring

to the pupils the power to think logically, to express this thinking clearly, and to apply this same kind of thinking to other work.

It occurred to me that the primary cause of most of the trouble in the study of geometry comes from the lack of harmony in the method of development and in the method of expression. Practically all of the formal demonstration in geometry in our schools is synthetic, while the preparation for it is analytic by nature.

I attacked the problem of discovering some means by which pupils could express their geometrical thought without the constant "backing-up" process involved in the common synthetic demonstration.

At first the pupils wrote out the analysis for the demonstration in paragraph form, merely as a preparation for the synthetic demonstration. I modified the plan of instruction from time to time as it became clearer to me that good geometrical thinking and expression are interdependent, and I finally devised the form paper shown on page 617 for the formal demonstration by analysis.

In connection with this form of expression I also devised a plan of suggesting, where necessary, the data from which pupils build up the demonstration so given, as to secure complete harmony of the expression and the preparation.

This plan of instruction depends upon a certain general preparation for it which at first may seem onerous and doubtful; but it is very important. I make both the development and the expression of a demonstration analytic. There is no attempt to adhere to the idea of a formal syllogism, but the pupils as a preparation for all demonstration are taught that every step must name first the conclusion, which we call a Major. (This, of course, is a misnomer so far as a syllogism is concerned, but is better than "conclusion," since it changes from step to step.) Then the pupils are taught that each

Major depends upon one or several minor premises, which we call Minors. The pupils are taught also that there must be an authority for the truth of the Major depending upon the establishment of the truth of the Minors. And, finally, the pupils are taught that every Minor must have a direct authority, which settles the argument, or else each Minor in turn must become a Major in the next step. (Refer to demonstration, page 617.)

Let us now take a particular theorem and follow the procedure in the classroom. First the teacher makes the assignment, which may be from the book, or may be written on the board. Suppose this assignment is the demonstration for the theorem: "If the opposite sides of a quadrilateral are equal, the figure is a parallelogram." The teacher places the following study outline on the board:

OUTLINE:

Theorem: (Left to the student.)

Given: $DC = AB$ (Figure here.)

$AD = BC$

Required:

$AB \parallel DC$

$AD \parallel BC$

Demonstration:

(Since the required contains two things exactly alike, prove one of them, then state that the other is proved by the same kind of argument.)

First Major depends upon one Minor involving angles; its authority is 73.

Second Major depends upon one Minor; its authority is 37.

Third Major depends upon three Minors whose authorities are 26, 26, and 34.

[These numbers refer to paragraphs in the text.]

You will notice that in the first suggestion the pupil is required to make the application of a cited authority in the expression of the Minor upon which the Major depends. This is true also in the second suggestion, but the kind of thing to be found and applied is different, since the first Major depends

upon equality of angles and the second Major depends upon the congruency of triangles. The third suggestion is such that the pupil is required to seek the three Minors upon which the Major depends and also the authority for their application, knowing as a basis for this search the authorities for the Minors.

I find it advisable to make the suggestions in such a way that the pupil must seek different kinds of things in the different parts of the demonstration. The teacher, knowing his class, must suit the suggestions to the class needs. I make the suggestions on the board a minimum and amplify personally where needed. The following rules guide:

1. The suggestions should be such that, together with the quantity of work, they will keep the brightest pupils strenuously employed.

2. The dullest pupils should be able to make some definite progress.

3. The suggestions should leave as much as possible to the pupils.

4. At the same time the suggestions should make it possible for all or nearly all the pupils to work up the demonstration.

In my classes the time divisions for work are not iron-clad, some propositions requiring more time for preparation, more explanatory matter, and more time for expression, than others. The following is perhaps the best approximation of time divisions: The first ten minutes of the sixty-minute period are given to recitation—a discussion of previous work, a summary, an explanation, etc. The next twenty minutes are devoted to writing on form paper the analytical demonstration of the proposition studied the day before. In the last thirty minutes the pupils prepare the work for the next day. The unit of the work begins with this thirty minutes.

The pupil begins his study by ruling up on scratch paper a form like that on which he is going to write his work the next day, and fills in "Theorem," "Given," "Required," etc. The suggestions sometimes leave all these to the pupil.

The pupil now determines his first Major, which he obtains from the "Required." By looking up the reference numbers for the authority, he finds he must fix two particular angles and uses them in expressing the Minor upon which the Major depends. As soon as this matter is settled, he discovers he has no direct authority for this Minor. He knows by the plan of procedure this Minor now becomes the Major in the next step. He proceeds with the second Major in the same way, the third, and so forward. In this way the pupil has a very definite problem throughout the course of the demonstration. He knows that his argument is settled at the exact point where every Minor has a direct authority. The next day he writes the complete demonstration on form paper. On the following page is such a paper taken from current work:

This work in geometry is in three classes, a total of seventy-five pupils. Among these are perhaps four or five "professional loafers," two or three so-called "subnormals," and four or five very bright children.

In contrast with other classes which I have had in geometry, it is my conviction that there is not a single individual in these classes who does not come to the classroom anticipating a delightful hour. There is not one who does not take the initiative in his own work. And when I consider attendance records, natural aptitude, sickness handicaps, etc., I believe there is not an individual who will not accomplish all that could reasonably be expected of him this semester. The whole experiment at the present writing has resulted in delightful working relations between pupils and teacher, both from an aesthetic viewpoint and from that of effectiveness of thinking on the part of the pupils.

This work provides for the brightest pupils in the class, and at the same time the dullest pupils make some definite progress. The possibility of meeting this problem of individual differences comes from the fact that the procedure in original work

NAME Wilbur Hahn Class 10' Period 1 Date 1-20-19 Mark

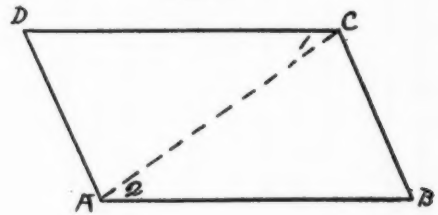
GEOMETRY DEMONSTRATION BY ANALYSIS

Theorem If the opposite sides of a quadrilateral are equal, the figure is a parallelogram.

Given AB = DC
AD = BC

Required ABCD is a ▱
or AB ∥ DC,
AD ∥ BC

Figure



Argument		Authority	
Major	**Minor**	**For Minor**	**For Major**
	Draw the diagonal AC		
1. AB ∥ DC	If ∠1 = ∠2		If two lines are cut by a transversal so the alternate interior angles are equal the lines are parallel.
2. ∠1 = ∠2	If △ABC ≅ △ACD		corresponding parts
3. △ABC ≅ △ACD	If AB = DC	Given	Two triangles are congruent if the three sides of one equal respectively the three sides of the other.
	AD = BC	Given	
	AC = AC	Identical	
∴ AB ∥ DC and AD ∥ BC	by the same argument		

is exactly the same as that of the "sequential theorems," and the bright pupils readily apply this working plan to additional work given them.

The development of this plan of instruction has been greatly facilitated by working in a school where supervised study is in vogue. I have not measured in a statistical way the results of this study by analysis as compared with the usual synthetic work, but I am sure of several things from observation:

1. Pupils become skilful in discerning the new problem constantly arising when Minors become Majors.

2. Pupils like to demonstrate when they feel they are doing a large part of the work constructively themselves.

3. Pupils have more initiative and are more independent, since the procedure keeps a very definite problem before them and they are not merely acquiescing in statements of a text.

4. Pupils are far more efficient in demonstration of originals, for the simple reason they are familiar with the true method of attack.

5. Pupils carry this analysis into other subjects, making it possible for them to grasp the problem and seek the premises for its solution.

Educational News and Editorial Comment

AMERICAN STUDENTS ABROAD

The influence of Germany in the United States for two generations before the war was due in no small measure to the fact that a great many advanced students had spent a year or more in German universities and had in many cases taken degrees in these institutions. Recognizing this fact, there has been a vigorous effort on the part of England and France since the war to make arrangements which will attract to those countries American students of the type that formerly went to Germany. Two announcements have recently come to hand indicating that France and her friends are active in this direction.

The Society for American Fellowships, 576 5th Avenue, New York City, announces twenty-five fellowships. These

The *School Review* is published monthly from September to June by the University of Chicago. It is edited and managed by the Department of Education as one of a series of educational publications. The series, including also the *Elementary School Journal* and the *Supplementary Educational Monographs*, is under a joint editorial committee and covers the entire field of educational interests.

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fellowships will be of the value of $1,000 a year for two years and will be open to properly qualified American citizens whether college graduates or with experience in industrial establishments in work requiring high technical skill.

The official announcement of the Society states that it has been organized by friends of French science and learning to "assist in establishing, in its proper place of eminence in the mind of the American public, the standing and repute of French scholarship."

In order to readjust the true balance, which, for various reasons has long existed in this country in favor of the German universities, it is proposed to encourage the development of a body of university scholars who by personal acquaintance with French achievements will be in a position to restore in all branches of American public opinion the just status of French science and learning and a better appreciation of the place of France in the leadership of the world. It is hoped by such means that those peoples of the world who cherish the same ideals of democracy, justice, and liberty will come to know each other better, and to co-operate more and more in the realization of their common hopes and ambitions.

A second announcement comes from the secretary of the Association of American Colleges and is as follows:

> Paris cables the creation of twenty scholarships in French lycees and colleges open to American girls. The applicants should be between 18 and 20 years of age and should be young women desiring to become teachers of French in American schools. The scholarships carry stipends sufficient to pay cost of tuition, board, and room.
>
> The Institut Catholique, of Paris, an independent Catholic university, also offers a scholarship carrying tuition, board, and room to a graduate of an American Catholic college.
>
> These scholarships, together with others which have already been filled, represent the desire of the French government to continue the policy of educational reciprocity established by the Association of American Colleges. This Association last year placed 114 French girls and 36 invalided French

soldiers in American colleges and universities, and now announces that scholarships have already been assigned for some 90 French girls in addition for the coming year.

Correspondence concerning these scholarships should be addressed to Robert L. Kelly, Association of American Colleges, 19 South La Salle Street, Chicago, Illinois.

The inducements offered by England have been of a somewhat different type. Oxford has launched the experiment of a doctor's degree, similar to that offered in Germany, on the theory that American students were attracted by the degree. This example has been followed by the municipal universities. Furthermore, the English universities made every possible effort during the war and after the signing of the armistice to provide for American soldier students. Admission to what we should call short-time courses was freely granted, and unlimited hospitality was shown to all who accepted the opportunities offered.

In the meantime the stream of students is flowing also from Europe to America. Universities and colleges on this side of the Atlantic have during the past two years awarded a large number of scholarships to foreign students, and several agencies in this country are actively promoting the plan of cementing relations both with our allies in Europe and with the countries of South America by this means. Chief among these is the American Council on Education which grew out of the emergency council organized in 1917 and which has performed large services for higher education especially by taking charge of the British and French commissions when they visited American institutions. The Council is now perfecting its organization and is aiming to co-ordinate all of the foreign educational relations of colleges and universities in this country.

The outlook for broad interchange of educational hospitalities is very bright, and the influences which will operate back and forth are important, not only for colleges and universities,

but also for all of the international interests of the civilized world. American education was very dependent on European scholarship until a generation ago. There are still lessons of importance which a democracy can learn from a more highly selective plan of education such as that which is common to all European countries. On the other hand, there can be no shadow of a doubt that American schools and American higher institutions are models in their freedom and flexibility which the older and newer civilizations are sure to copy in many respects. That there should be a give-and-take in matters of education is as important for international union as that there should be a framework of international law and a machinery of international administration.

ECONOMY IN HIGHER EDUCATION

In 1913 a committee of the National Council of Education known as the Committee on Economy of Time in Education rendered an elaborate report in which it made clear the fact that American education is wasteful. It proposed a program which would bring the student into college and into the professional school at an earlier age. This committee has now asked to be discharged and in doing so offers once more a program. The report in part is as follows:

Our correspondence with colleges has revealed much frank self-criticism. They acknowledge the need to better adapt college courses to the demands of today, define aims more clearly, distinguish between essential and non-essential subjects and matter, train more thoroughly in methods of study and power of reflection, make the teaching more vital, and increase the industry of the student and his interest in his own intellectual and spiritual development. It is noteworthy that the criticisms resemble those previously printed regarding the elementary and secondary schools. It is also worthy of comment that nearly every correspondent believes college admission should be at an earlier age.

Of views lately received by your committee from faculty members of twenty-two universities, fifteen favor the following proposition, seven opposing: To merge the Senior College and the Graduate School into a General

Faculty of genuine university rank, on a level with the professional schools, to the end of increasing the intellectual power by earlier use of university methods, getting rid of the evils that have crystallized around the forms of "College" and "Graduate School," and reinterpreting the culture ideal in the light of the present. [This would result, not in abolishing the college, but in readjusting it in years by the "telescoping," which now appears feasible, between the elementary school, the high school, and the college.]

This reorganization is urged on several grounds. First, reference is made to the detailed work done in the field of elementary education by a committee of the Department of Superintendence of like name. Second, the spread of the 6-3-3 plan is hailed as a move in the general direction of economy. Third, comment is made on the new spirit which the war has brought into education. The following paragraph from the report touches on this matter:

The demand of the government on the schools in the war period cannot but affect the problem. We believe that the experience of these years and the new insights into social and political questions will influence three things —earlier opportunity to prepare for occupations and more efficient training of skilled hands to supplant the army of the idle and incompetent and unprepared, and earlier entrance to special courses in science and to professional studies in response to increasing practical demands; greater economy and efficiency in the whole field of education; a clearer conception of what is essential in culture to preserve our national ideals and to develop the sentiments which make for democracy, peace, and for the principle to be applied in industrial and international problems and in all human relations—co-operation under justice.

The discharge of this committee leaves a responsibility which ought to be taken up by some strong national organization. It is as clear to the student of higher education as the day that there is to be a sharp and vigorous movement toward more efficient and more economical professional education in this country. Colleges and high schools, especially in the older sections of the country, have been and are shockingly conservative. They waste time of students and of society in the

name of culture when in fact they are dallying with the cheapest sort of personal luxury. The epoch is at hand when economic and social forces of a world-wide range are impinging on American education. We cannot go on as if nothing had happened.

The question now is: Are there to appear leaders who will by counsel and broad discussion set our system in order, or is the disintegration of the old to be followed by miscellaneous experiments here, there, and elsewhere, resulting in a new and slowly progressing chaos? American colleges and American high schools have never organized in a national way in the interests of education. Sections have organized to perfect the means of certifying students or for the purpose of mutual protection. Who can find an organization broadminded and representative enough to work out some such program as the Committee on Economy of Time in Education leaves to the world?

AMERICAN EXPEDITIONARY FORCES UNIVERSITY

A series of publications issued by the American Expeditionary Forces University in France shows in a very interesting way how the opportunity was seized between the armistice and the sending home of American soldiers to impress on them some of the needs of the new world. Bulletin No. 92, for example, is on the Principles of Democratic Government; No. 18 is on Society as a University; No. 93 is on Applied Arts and Education; No. 63 is a Memorandum on Education as an Item in the League of Nations.

Especially interesting to the student of education is Superintendent Spaulding's Bulletin No. 96 entitled "Educate America." This is a plea for a longer and more uniform school year and better attendance laws throughout the United States, for complete control of private schools, and for better training of teachers. It is a plea for national, vocational, and civic

education even to the extreme of universal training of a military type of all male citizens. It is a strong plea for national support and a measure of national control of education.

The following page from the bulletin may be quoted as the culmination of Mr. Spaulding's argument:

> The time has now clearly arrived when education generally should be considered and treated as of great, indeed the greatest, national concern. The crisis of the war helped to make this fact stand out in clear relief. At once it became apparent to every thinking person that the thousands of unassimilated foreign groups, millions of people, speaking scores of different languages and dialects, but understanding no word of our national tongue, were not exclusively or even chiefly, the concern of Fall River, of Newark, of Philadelphia, of Cleveland, of Chicago, of Milwaukee, of St. Paul, of Seattle, but of the nation; it became apparent that millions of native born illiterates, white and colored, were not exclusively, or even chiefly, the concern of Louisiana, of South Carolina, of Alabama, of Mississippi, of New Mexico and Arizona, but of the nation; it became apparent that the failure of local communities to provide technical training in sufficient variety and extent was a matter of national concern.
>
> And the concern of the nation in the results of our weak and inadequate, locally independent, educational systems, was by no means confined to the effects on military efficiency; the effects on our whole national life, on our unity of purpose and effort, were cause for far graver concern.
>
> Let us not deceive ourselves; the gravity of the situation in which we found ourselves two years ago has not passed, has not even materially changed for the better. The fact that we were able, by supreme efforts stimulated by witnessing for nearly three years the titanic struggle between the Devil and Righteousness, with the issues gradually becoming so simple and so clearly drawn that the most elementary human intelligence could hardly escape a choice, the fact that we were able at last to range ourselves on the side of Righteousness does not make of us for all time a unified people, invincible because of our common ideals and aspirations. The great task of achieving real national unity is still before us; the war's crisis disclosed how far we are from this goal, and brought home to us the supreme importance of attaining it. In going about this task, education must be our one great reliance.
>
> National financial support in considerable measure, coupled with a certain degree of national direction and control, appears to be the only practicable method of dealing with the large educational problems that confront

our country. The necessary financial support should be given and the direction and control exercised in a way to encourage and increase the support and responsibility of states and local communities. This is entirely feasible by making the extent of national support dependent upon certain practicable degrees of state and local support and the observance of certain very general policies, fundamental to the attainment of the great objectives to be attained, and at the same time by leaving to the states and the local communities the greatest measure of freedom and initiative in devising plans of organization and methods of procedure and in adapting these to local conditions, traditions, ideals, and even prejudices.

This quotation puts the matter with such vigor that supplementary comment is hardly necessary. The point which is made ought not, however, be lost. The ends here sought cannot be attained if a federal department of education is created but is deprived of all power. If the federal treasury is to be drawn on for support, there must go with support the right to see to it that improvement is achieved by communities and states. The Towner bill now before Congress has been drawn with the aim of making it as nearly impossible as the authors can make it for the nation to force the accomplishment of the ends which Mr. Spaulding has outlined. The Towner bill is weak and will be ineffective unless it is strengthened in line with such demands as Mr. Spaulding outlines.

THE METRIC SYSTEM

The World Trade Club is carrying on a vigorous campaign for the adoption in this country of the metric system. The material which is being sent out by this club includes the following items:

John Hays Hammond, great mining engineer, wired World Trade Club from Washington, D. C.: "I endorse metric system as the universal standard. I am convinced from an extensive study of international commerce that the adoption of the metric system would greatly facilitate promotion of the export trade of America."

Thomas Corwin Mendenhall, of the United States Geodetic Survey, who has the added distinction of being the one to induce President Harrison to

promulgate the Board on Geographic Names, said in a presidential address before the Engineers' Societies, of meter-liter-gram: "These units are bound to come into universal use in the near future. The prodigious advantages attainable through their simplicity, economy, and uniformity assure their world-wide use."

American Institute of Electrical Engineers has voted for the adoption of meter-liter-gram for general use by a large majority.

"Not one of the accurately standardized gauges at present in use in British and American engineering workshops will need to be changed when the metric system is adopted," is the declaration made by the great inventor, Lord Kelvin.

The American National Wholesale Grocers' Association voted overwhelmingly in favor of adoption of metric units.

The American National Canners' Association urges adoption of metric units. This sentiment was passed at a convention of 5,000 delegates.

Among the many other important organizations which have been active in advocating meter-liter-gram are: Associated Steel Manufacturers of United States of America; American Association for the Advancement of Science; American Drug Manufacturers' Association; American Institute of Chemical Engineers; American Pharmaceutical Association; American Institute of Makers of Explosives; National American Association of Retail Druggists; National American Association of Wholesale Druggists; National American Scale Men's Association.

ART EDUCATION

The teachers of art have become more than usually aggressive in the advocacy of their specialty in the last months. They point out that what is needed to make American wares salable in the world market is better taste on the part of American designers and better taste on the part of the American public. They have recently induced the Department of the Interior to publish a series of charts which set forth the importance of industrial art.[1]

Two extracts from the pamphlet containing these charts are as follows:

The most successful industrial art schools in the world were established to meet situations similar to those of the United States today. Foreign

[1] H. M. Kurtzworth, *Industrial Art a National Asset*. Industrial Education Circular No. 3, May, 1919. Bureau of Education. Pp. 31.

industrial art schools are almost without exception subsidized by the state. Foremost among all schools of industrial art stand the schools of arts and crafts of Great Britain, which are the outgrowth of the fact that the Parliament had taken steps in 1835 to appoint committees and provide funds for the establishment of the school of industrial arts at South Kensington, which was opened in 1837 to counteract the growing menace of German skill in design.

In 1851 the school was much criticized at the London Exposition because Great Britain was still outranked in quality of design by all great nations except the United States. Germany still outranked England in fine manufactured products. The school continued, however, and at the Paris Exposition of 1867 England was among the foremost producers of the finest goods. The expansion of her art schools under the London County Council has continued to increase this advantage. In 1918 the United States is still near the bottom of the list in industrial art schools, as well as in merit of products.

The business men of England, and of Boston, Philadelphia, Providence, Chicago, and Grand Rapids were the first to urge the need and take steps toward establishing their industries on a more permanent and competitive basis through the training such schools could give.

The prosperity of the Nation, the city, and village as well as of the individual, depends upon the "turn over" of their products as sold in the stores not only of our own country but in those of the entire world.

Next to competition upon the ground of price, which is the chief factor in the sale of goods, without other merit, the competition for goods made attractive through superior design and durability shows the wisdom and need for our cities to take definite steps toward the establishment of industrial art schools.

These schools will in time increase the quanity and value of the manufactures of their cities and of the Nation—

1. By training the designers, workmen, and salesmen to sell superior products in the thousands of stores of their class.

2. By training the buyers and users to discriminate between the ugly and the bizarre and to be able to choose and demand goods of merit.

The public is persuaded of the truth of such statements. Does this tend to bring cordial support to the art courses offered in high schools and grades? Does the work in color and drawing which our schools give cultivate taste in common things? Do art teachers know what they are about? Do they make

clear statements in faculty meetings? Do they have tests which show how far their pupils have progressed?

In the main, art as taught in American schools is blind and formal. There is appearing in the *Elementary School Journal* a study on art results which justifies the sharpest criticism of most art courses. While the teachers of art are campaigning for greater interest in industrial art is it not legitimate that students of education in general ask them to study their own work and reorganize it along definite lines?

News Items from the School of Education of the University of Chicago

SUPERVISING ENGLISH IN THE UNIVERSITY HIGH SCHOOL

The faculty has adopted a program of co-operation in supervising English by which topical recitations, both oral and written, are prescribed for every class in which English is the medium of expression. Standards of form, as set forth in a *Manual of Usage*, include in written work legibility, correct spelling, accurate punctuation, and avoidance of error in grammar; in oral work the *Manual of Usage* requires reasonably sustained and dignified address, correct pronunciation—clean speech in general. Themes collected from all classes are examined by the committee and, before being returned to the pupils, are for a time placed on file in the faculty room. Oral work is supervised by exchange visits which makes it possible for every teacher in the school to visit one or more recitations of his colleagues each month.

EDUCATIONAL RESEARCH IN HOME ECONOMICS

The reconstruction of home economics courses in elementary and secondary schools is the ultimate object of some research undertaken by a group of instructors in the Home Economics Departments of the University of Chicago and of Iowa State Agricultural College. These investigations have attempted to answer the following questions: (1) What is the present purpose of home economics teaching? This study is based on an analysis of the aims and intended outcomes of home economics instruction as stated in the courses of study, textbooks, and in other literature relating to the field. (2) What is the pupil studying? The answer to this question is based on an analysis of the content of the text and reference books used in 95 per cent of the school systems of the United

States which use textbooks, and on an analysis of the content of present courses of study in seventy typical school systems where no texts are used. (3) What can the home teach us? In this connection a survey of three different groups of housewives is being made to determine the effects of home economics teaching upon actual home-making activities and the needs of the home which home economics instruction ought to meet. (4) How can we test the course of study and its results? In this connection an attempt is being made to devise a practicable system of content and reasoning tests and of tests for measuring skill—for example, skill tests for machine sewing.

Articles treating various phases of the investigation will appear from time to time in the *School Review*, the *Elementary School Journal* and the *Journal of Home Economics*. The final results of the investigation will be reported in a forthcoming number of the *Supplementary Educational Monographs* published in conjunction with the *School Review* and the *Elementary School Journal*.

THE ORGANIZATION OF SELF-RATING BLANKS

Dr. H. O. Rugg, of the School of Education, has completed the first two of a series of rating forms for judging students, teachers, prospective teachers, and administrative officers. The essential feature of the cards is that they are constructed in such a way as to enable an individual to rate himself and at the same time provide a definite method by which a teacher may rate a high-school student, or an administrator a teacher. The key of the scheme is "self-improvement through self-rating." One rates himself by answering definite questions concerning the extent to which he does or does not do certain things. The form for rating high-school students and teachers in service will be followed in the autumn by others for prospective teachers in schools of education and normal schools and administrative officers.

DEVELOPMENT OF GROUP INTELLIGENCE TESTS

During the war great impetus was given to the development of general mental ability or intelligence tests by their use in the examination of army recruits. A very efficient instrument for intelligence examinations exists in the Stanford revision of the Binet Scale, but for general application a test which can be given to entire groups simultaneously and scored rapidly is necessary. The army tests were designed for the adult level. Dr. F. N. Freeman and Dr. H. O. Rugg have been at work on a group test which is intended particularly for the junior and senior high-school students. Two parallel forms of the test of approximately equal difficulty are approaching final form. They are printed and ready for distribution at a moderate price, three cents each. This price includes instruction and scoring sheets and blank forms for the tabulation of results.

Educational Writings

I. A SURVEY OF RECENT BOOKS IN SECONDARY SCHOOL ENGLISH

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A. ANTHOLOGIES

During the past twelve months, September, 1918 to September, 1919,[1] there have appeared six anthologies of English and of American literature significant for teachers of high-school English. Notable among these is Greenlaw and Hanford's *The Great Tradition*.[2] Three distinctive features characterize this anthology of English literature. The first is that the old academic distinction between the writings of Englishmen and the writings of Americans is discarded; all are included in one representative literature of English-speaking people on both sides of the Atlantic. A second feature, as the title indicates, is the stressing through literature of the two supplementary principles of Anglo-Saxon civilization, freedom of the individual and respect for constitutional authority: liberty under the law. The book is distinctly planned to bring an enlivened interest and a clearer interpretation of what Democracy means. The third feature has even greater meaning for all teachers of English, who, favoring a far broader scope for the study of their subject than the mere literary analysis of masterpieces, are more and more stressing the content of literature as it reveals and interprets the life of the Anglo-Saxon race. Beginning with "The Renaissance," ending with "The Crisis of Democracy," the book presents not alone *literary history* in the narrower sense. Selections are shown as landmarks in the march of the Anglo-Saxon mind from the beginning of the modern period in the fifteenth century down to Woodrow Wilson's address at the Tomb of Washington.

The authors apparently intend the book primarily for college classes; indeed its cost probably precludes its use except for reference in high-school

[1] For review of books 1917–18 see *School Review*, XXVI, October 1918, 621.

[2] Edwin Greenlaw and James Holly Hanford, *The Great Tradition*. Chicago: Scott, Foresman & Co., 1919. Pp. xii+679. $2.25.

classes. However, neither the selections nor the method of treatment are inappropriate for the upper grades of the high school or for junior-college classes.

Another well-known collection for junior-college classes has been revised and brought down to date. *Century Readings for a Course in English Literature*[1] has added sixty pages of literature from the late Victorian Period and from the Great War. The fact that this volume has been reprinted on the average of twice a year since its first edition in 1910 testifies to its usefulness and popularity.

The Great Tradition, then, is especially suggestive to teachers who desire to carry out in their upper high-school and junior-college classes the injunction of the National Committee on the Reorganization of English when they recommend less emphasis upon style and greater stress upon content.[2] Moreover, for exactly the same reason junior high-school departments will welcome the first volume of a three-volume series entitled *Junior High-School Literature*.[3] Two other volumes are in the course of preparation. Titles of the four main divisions of Book I indicate how the authors have grouped their materials, avoiding any distinction between the English and American branches. Part I, "Stories and Poems of Nature," includes four classifications: Animals, Birds, Flowers and Trees, and Winter; Part II, "Adventures New and Old," includes The Days of Chivalry, Narratives in Verse, Stories of the Sea, and Tales from Shakespeare; Part III is "Ideals and Heroes of Freedom;" Part IV, "Literature and Life in the Homeland." In all, the authors present 600 pages, in excellent type, upon excellent paper, of prose and poetry well within the comprehension of seventh-grade pupils. So far as possible the authors endeavor to instill the love of good reading through the content rather than through literary values. Such a praiseworthy endeavor can receive only commendation. In the case of a junior high-school book, however, the comment might be pertinent that no provision whatever seems to be made for training in silent assimilative reading. We are given only a partial breaking away from the domination of purely literary study. In Book I American authors greatly outnumber the British and are represented by very many of the selections familiar in upper-grade curricula.

The year has produced for junior high schools another anthology whose 600 pages are divided about equally between English and American authors,

[1] J. W. Cunliffe, J. F. A. Pyre, and Karl Young, *Century Readings for a Course in English Literature*. New York: The Century Co., 1919. Pp. 1,024.

[2] *Reorganization of English in Secondary Schools*. Bulletin, 1917, No. 2, Department of the Interior. Pp. 46.

[3] William H. Elson and Christine M. Keck, *Junior High-School English*. Chicago: Scott, Foresman & Co., 1910. Pp. 607. $1.00.

Field's *Readings from English and American Literature*.[1] The purpose is "to meet the demands of teachers of English in high schools that pupils shall come to them equipped, first with a speaking acquaintance with the world's famous writers, and, second, with sufficient understanding and appreciation of literature to discuss selections with intelligence and enjoyment." This is a high aim and a worthy purpose. But in spite of the fact that Mr. Field tells the story of Chaucer and Spencer and Milton in delightfully simple and direct form, and follows each with selections that the children can understand, the present writer cannot approve of the principle involved: teaching the history of literature to seventh- and eighth-grade pupils. And why English literature for seventh- and American for eighth-graders? Senior high-school teachers would far more wisely demand that the junior high school teach pupils economical and efficient methods of reading, of getting from the printed page the content of easily read expository and narrative prose. Moreover, the selections to be suitable at all need in Mr. Field's volume to be very fragmentary indeed. It is true that all of the great names in our history appear, but to children of 12, 13, 14 years of age they can be little more than a string of names. If one grants the correctness of the aim, as many do, as the majority of curriculum makers do, Mr. Field's book ranks very high indeed. At the close of each section the author gives an extended list of questions, many of which are thought-provoking.

Professor Payne's admirable little anthology which was called in its 1917 edition *American Literary Readings* has appeared under a new title, *Selections from American Literature*.[2] The selections follow the same sequence of authors as in the first edition beginning with Irving and extending to Moody. Certain of the less important selections of the first volume are omitted; a few new selections are added. Forty pages or more have been added to the notes. Pictures of authors are omitted in the new edition as well as the outline of American literature which appeared in the earlier edition as an appendix. The cheapness of the book will make it available in many schools for which more expensive volumes are out of the question.

In the introductory note of his volume, *Century Readings for a Course in American Literature*,[3] Pattee indicates the reason why the number of our anthologies is rapidly increasing. He insists that classes of all grades must study literature itself rather than study *about* literature. Moreover, like

[1] Walter Taylor Field, *Readings from English and American Literature*. Boston: Ginn & Co., 1919. Pp. x+593.

[2] Leonidas Warren Payne, *Selections from American Literature*. Chicago: Rand McNally & Co., 1919. Pp. xiv+636. $1.45.

[3] Fred Lewis Pattee, *Century Readings for a Course in American Literature*. New York: The Century Co., 1919. Pp. xvi+890.

several of his contemporary compilers, Pattee asserts that he has done far more than make a handbook of American literary art; he has made "a handbook in Americanism and an interpretation of the American spirit by those who have been our spiritual leaders and our voices." The book of 900 pages with 40 pages of notes follows the chronological order of authorship, wisely beginning with Franklin's Autobiography, passing quickly to the major figures of Irving, Cooper, and Bryant, and ending with selections from O. Henry. Four major periods are distinguished—The Period of Beginnings, The New England Period, Period of Transition, and The National Period. This anthology is unusual in one respect: quite a number of names appear, like those of Royall Taylor, Alexander Wilson, and William Wirt, which do not usually break into the select circle of a school anthology. The best of American short story is illustrated by the presentation of examples from each decade following Irving. The volume is neat and attractive and does not appear heavy or bulky in spite of its 900 pages. Condensed biographical notes precede the selections of each author.

B. CLASS BOOKS OF VERSE AND PROSE

It was inevitable, and indeed highly appropriate, that the last year as the year before should produce a number of books for class use, the burden of whose content is nationalism, patriotism, civic ideals, and duty. This fact may be welcomed as further evidence that secondary-school English instruction is rapidly assuming a function far wider than mere drill in literary forms and a somewhat vain endeavor to teach appreciation of masterpieces of literature beyond the comprehension of young people. Among these books of wider meaning is one called *Verse for Patriots*,[1] a volume of 350 pages, the size of which is its chief shortcoming. Three hundred and fifty pages of poetry, even if they teem with vital concrete matters of daily import, may terrify high-school pupils who at best shy away from poetry in any form. Ten chapters are entitled "The 'Last' War," "The Call," "Heroes," "On Land and Sea," "Dying for One's Country," "National Hymns and War Songs," "Home and Country," "The Flag and Freedom," "Peace After War," "The True Patriot." Of the 250 poets whose verses are quoted, scores are unknown to the average reader, and certainly unique in a school "classic." The compilers have diligently searched the current magazines of recent years and have culled out a body of verse, which, if hardly worthy to be compared with literary masterpieces also included in the volume, is in mean-

[1] Jean Broadhurst and Clara Lawton Rhodes (editors), *Verse for Patriots, To Encourage Good Citizenship*. Philadelphia: J. B. Lippincott Co., 1919. Pp. xi+367. $1.12.

ing and content well adapted to high-school pupils, and able to make them recognize that literature is a living reality, being produced daily all around them. Berton Braley and Longfellow, Robert Chalmers and Emerson, Grantland Rice and Tennyson—they are all there—250 poets and near poets, all singing of America's larger patriotism.

Representative American Poetry[1] is a 1919 addition to Merrill's English Texts, than which in form and size and attractive appearance there are none better adapted to high-school work. The collection is small, only 150 pages; it deliberately omits almost all the authors "great in story," being intended as the editor says to be "human," not "classical." Patriotic setting is apparently the index of choice used by the editor. The volume is designed for ninth-grade classes.

Five "classics," composed largely of patriotic prose but including also some poetry, appear under the titles *American Patriotism*,[2] *Builders of Democracy*,[3] *Washington to Wilson*,[4] *Bryce on American Democracy*,[5] and *America and Britain*.[6] The first has 200 pages of prose considerably more than half of which is of the past five years, with a setting of 75 pages from Patrick Henry to Daniel Webster; 60 pages of patriotic verse close the text. It is inevitable that this and similar collections contain many items that are mere fragments. Professor Greenlaw has brought reading matter together in the second of these volumes intended to serve as "propaganda for good citizenship." The three grand divisions of the volume are The Call to the Colors, The Builders and Their work, and Soldiers of Freedom. The central purpose is "to give to boys and girls a clear idea of the relationship between England and America as the joint founders of free government." The editor reiterates in his preface the same broad and enlightening grasp of THE NEW TEACHING OF ENGLISH that he voices in his epoch-making introduction to *The Great Tradition*.[7] n *American Democracy* Mr. Finley has put his name to, and has written an introduction for, a volume of great merit, most of the text of which was edited and prepared by other workers. It is designed to

[1] E. B. RICHARDS (editor), *Representative American Poetry*. New York: Charles E. Merrill Co., 1919. Pp. 158.

[2] J. MADISON GATHANY (editor), *American Patriotism in Prose and Verse*. New York: Macmillan, 1919. Pp. x+304.

[3] EDWIN GREENLAW (editor), *Builders of Democracy*. Chicago: Scott, Foresman & Co., 1918. Pp. xii+358.

[4] JOHN H. FINLEY (editor), *American Democracy from Washington to Wilson*. New York: Macmillan, 1919. Pp. xxii+388.

[5] MAURICE G. FULTON (editor), *Bryce on American Democracy*. New York: Macmillan, 1919. Pp. xxii+388.

[6] H. H. POWERS, *America and Britain*. New York: Macmillan, 1919. Pp. iv+76.

[7] EDWIN GREENLAW and JAMES HOLLY HANFORD, *The Great Tradition*. Chicago: Scott, Foresman & Co., 1919. Pp. xii+679. $2.25.

prove that Washington, Webster, Lincoln, Roosevelt, and Wilson have all enumerated the same principles. The book devotes 100 pages to the speeches of the first four men, 160 pages to President Wilson's speeches, and 75 pages to excellent notes, including somewhat superfluous summaries of the lives of the five men.

Bryce on American Democracy, containing selected chapters from *The American Commonwealth* and one lecture from *The Hindrances to Good Citizenship*, also purports to be useful "in the new emphasis the schools are giving to democratic ideals and broader conceptions of national life." Bryce is fairly heavy reading for high-school pupils, but senior and junior classes may well substitute the selections for still more difficult readings like Milton's *Minor Poems*. Mr. Fulton gives the setting in which *The American Commonwealth* fits in a terse introduction, and accompanies each section with careful historical and interpretative notes in appendices.

Of an entirely different order is the fifth little book, *America and Britain*. Indeed, it is not primarily intended for high-school classes. In simple, terse, expository style Mr. Powers lays before his readers the historical relations between America and the mother country. "The story of Anglo-American relations is not an idyll . . . of mutual chivalry. It is the record of two very human peoples" who have on the whole been growing closer in mutual understanding and common ideals. The book is well worth the attention of teachers who desire to correlate English and history.

Quite in accord with the general purpose of the five books just considered are the class books which present in new form the old friends *The Speech on Conciliation*[1] and the *Making of an American*.[2] The former includes several other speeches by Burke, Pitt, and Fox. The Macmillan Pocket Classics have been supplemented by three novels.[3] The Lake Classics have been increased to include two volumes of short stories and one called *One Hundred Narrative Poems*.[4] The Riverside Literature Series has added Miss Peabody's *The Piper*.[5]

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[1] C. H. Ward (editor), *Speech on Conciliation with America*. Chicago: Scott, Foresman & Co., 1919. Pp. 319.

[2] Jacob A. Riis, *The Making of an American*. New York: Macmillan, 1919. Pp. xi+284.

[3] Scott's *Guy Mannering*, Eva Warner Case (editor). Pp. xxxvii+499.
Curtis' *Prue and I*, Vincent V. Brecht (editor).
Kingsley's *Westward Ho*, Sterling A. Leonard (editor). New York: Macmillan, 1919. Pp. x+483.

[4] Harry C. Schweikert (editor), *French Short Stories* and *Russian Short Stories*. Pp. 319 and pp. 450.
George E. Teter (editor), *One Hundred Narrative Poems*. Chicago: Scott, Foresman & Co., 1919. Pp. 436.

[5] Josephine Preston Peabody, *The Piper*. Boston: Houghton Mifflin Co., 1919. Pp. 212.

C. HISTORIES OF LITERATURE

The only new book in this field which has come to the attention of the *School Review* is Payne's *History of American Literature*,[1] a companion volume for the same author's *Selections from American Literature* noted above.[2] No doubt the author of this history would be one of the first to admit that America produced no real literature before Freneau and Franklin; indeed, his anthology opens with Washington Irving. If this be true why should the heads of our pupils be filled with the names of a few score of obscure *Stracheys* and *Sandys* and *Byrds*, especially since the text can contain only paragraph examples from their writings, and often none at all? However, in this regard the present author has been compelled to yield to the historian's demand for beginnings and completeness, as every other writer has been compelled to do, and perhaps ever will be. Mr. Payne's discussion of the lives of authors is clear; his facts are judiciously selected in the main, although the cause of Irving's bachelorhood and a few similar superfluities are in evidence. George Ade's satire is in point. Speaking of a woman's club Ade says, "After the club had been running a few months it was beginning to be strong on quotations and dates. The members knew that Mrs. Browning was the wife of Mr. Browning, that Milton had trouble with his eyes, and that Lord Byron wasn't all that he should have been, to say the least." So often our high-school pupils. However, granting that we should not find fault with procedures we cannot improve, and granting that no one would expect a historian to disregard universal practice, we must admit that the present author has added another respectable volume to our histories. The text is refreshing with its 47 illustrations and the pleasing spirit of Mr. Payne's interpretation. Why should such a volume omit an index?

A revised edition of Brander Mathews' *American Literature*[3] presents in compact form, in the author's attractive style, a running fire of facts and interpretation concerning eighteen of the literary lights of America. A very brief introductory chapter covers a discussion of the colonial period, and another chapter called "Other Writers" at the end of the book also disposes of our minor authors. This book remains one of the very best. Illustrations abound, not the least interesting of which are numerous pages of facsimiles of handwriting of famous men. Another revised edition, Hinchman's *English*

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[1] LEONIDAS WARREN PAYNE, *History of American Literature*. Chicago: Rand McNally & Co., 1919. Pp. x+376.

[2] See p. 635.

[3] BRANDER MATHEWS, *An Introduction to the Study of American Literature*. New York: American Book Co., 1919. Pp. 268. $1.20.

and American Literature[1] appeared late in 1918. The author lives up to his promises, namely to fasten the attention of pupils upon men and what they did rather than upon standardized opinions about their literary art, and to give attention only to those whose works high-school pupils are likely to read. This volume of 525 pages exclusive of the index is distinctly adapted for high-school seniors.

A fourth book which falls within the category of histories of literature is positively unique. Professor T. E. Rankin, of the University of Michigan, has catalogued contemporary American authors of the United States and of Canada,[2] and has given salient facts about each. One hundred and forty Americans are named, writers of prose and of poetry. Teachers of high-school classes certainly ought to have Mr. Rankin's work as a desk book, although it is hardly suited for a class book.

D. TEXTBOOKS IN COMPOSITION AND GRAMMAR

The Briggs and McKinney *First Book of Composition* is now followed by its complement,[3] intended for the third and fourth years. As their elementary book was one of the first to substitute units like Attention and Interest for purely rhetorical and grammatical units, so their second book removes the subject of oral and written composition from the realm of the purely academic. Major units of the new book are Explanation, Argument and Debate, Journalism, the Short Story, Letter Writing, and a final chapter called "Some Rhetorical Principles." Argument is "taught through advertising, salesmanship, and circular letters," say the authors, and the other forms of discourse, too often receiving undue emphasis as purely rhetorical matters, are here connected in practice and in *use* through activities close to the lives of the students. This is a high-grade laboratory book, which will furnish abundant materials for the one or possibly two days or week which are usually employed in composition during the last two years.

At least one of the chapters is badly balanced. Chapter ii devotes 17 pages to argument and 50 pages to debate. Naturally the authors have examined the dozen or so textbooks of the last decade in this subject, all of which are adaptations of George P. Baker's work. Why, then, did they fail to see that common-sense and common practice give the larger portion of

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[1] WALTER S. HINCHMAN, *A History of English and American Literature*. New York: The Century Co., 1919. Pp. xii+519. $1.52.

[2] T. E. RANKIN, *American Authorship of the Present Day (Since 1890)*. Ann Arbor, Michigan: George Wahr, 1918. Pp. 121.

[3] THOMAS H. BRIGGS and ISABEL MCKINNEY, *A Second Book of Composition*. Boston: Ginn & Co., 1919. Pp. xi+513.

time to argument, recognizing debate as merely an application of the principles? In one form or another they do include all of Mr. Baker's principles of good argument in the portion of the chapter which deals with debating. Withal, Briggs and McKinney are so courageous in their innovations and their books are so little open to the insinuation, that there may be permitted here one vain wish: that writers of textbooks, in composition at least, should be prohibited by law from ever examining the content of similar books.

Very attractive in binding, form, printing, illustrations, and general appearance is the second book in the category of compositions.[1] Mr. Crawford has not intended to prepare an elaborate treatise on composition; he has merely tried to prepare an easy introduction to the study of English, divided into 30 chapters, one for each school week, each subdivided into daily lessons. In short, the plan of the book, as well as the mingling of composition, literary selections, grammar, penmanship, dictation, and the rest, all indicate that Mr. Crawford would carry over into the lower grades of the high school methods of treatment which Elson, Spaulding, Pearson, Driggs, Potter, and the rest apply to their upper-grade texts. In one respect at least *The Study of English* takes first rank among its contemporaries: it is constantly endeavoring to stay a little below the maximum assimilative and constructive capacities of its children. This volume comes closer to being a good junior high text than any the present reviewer has seen. Mr. Crawford is apparently a reverent admirer of Rollo Walter Brown's advice to the effect that our schools should teach American children to write as French schools teach their children to write. Strange that those whose business it is to teach children to think seldom question the false analogy based upon Brown's admirable exposition of French practice. The result of Mr. Gordon's devotion is felt in a somewhat over-attention to language drill. The main unit of almost every month is a conventional language or rhetorical topic like sentence, verbs, description, etc.

Five short chapters under the heading Introductory Work constitute Part I of the new Holt composition text, *The Writing of English*.[2] These chapters, "Writing and Reading," "Reading Aloud," "Use of the Library," "Use of the Dictionary," and "Good Form," consist of the authors' direct advice to the learners. They smack of oral talks which English Zero (college freshmen below English I level) teachers appropriately give their pupils. Part II, "Technique," includes the chapters: "The Sentence," "The

[1] Douglas Gordon Crawford, *The Study of English*. New York: Macmillan, 1919. Pp. xx+338. $1.20.

[2] John Matthews Manly and Edith Rickert, *The Writing of English*. New York: Henry Holt & Co., 1919. Pp. 509.

Paragraph," "Purpose in Writing," "Narration," "Description," "Exposition," "Argument," "The Values of Words," "Imagination." Part III, "Practice," includes nine chapters, of which "Newspaper Work," "The Short Story," "The Short Paper" are most prominent. An 80-page appendix contains one section which alone is worth to teachers of English many times the price of the book. Under "Sentence Faults" are listed and illustrated 100 items. Every teacher who believes that the chief function in the purely technical phases of her work is to impart a "sentence-control" should own this book.

Book II of Brubacher's *High-School English*[1] appears this year in revised form, the chief feature of which is greatly increased stress upon oral composition which has come to the fore since 1912, the date of the first edition. A very good chapter on Oral Expression has been added; oral assignments are scattered throughout the other parts. An unusual note in books of this category is the chapter on Criticism which endeavors to "give the pupil the necessary tools for thoughtful, enjoyable reading." This book is delightful in appearance, and avoids the bulky, heavy, confused, and confusing appearance unfortunately given by many language books.

Why should this book be called *Vocational English*, A Textbook for Commercial and Technical Schools,[2] is the question one asks upon examining the contents of the text so named? The writers have sensibly concluded that vocational English like all English is a matter of the combination of good substance and of good form. Moreover, they have faced squarely the fact that of all people who ought to be given thorough and persistent drill in good form, students who aim at vocations are most in need. Therefore, Part I is a thorough grounding in principles of correct English; Part II includes the major units Composition, Letters, Advertising. The fact that vocational pupils inevitably must be thoroughly grounded in good form justifies the authors in a plan of organization in their text which would be objectionable for other high-school classes. In the hands of an unimaginative teacher the result of the organization might be a half-year of learning and drill and a half-year of practice, while in very truth the two aspects of the work must go hand in hand.

Companion to the section on Sentence Faults in Manly and Rickert, is the excellent chapter xvi of Bowlin and Marsh, "Types of Errors in High-School Themes." One asks: Why not "Types of Errors in Vocational Writing?" An equally good chapter is xxi, "Mistakes in the Language of Letters."

[1] A. R. Brubacker and Dorothy E. Snyder, *High School English. Book II.* New York: Charles E. Merrill Co., 1919. Pp. 373.

[2] William R. Bowlin and George L. Marsh, *Vocational English.* Chicago: Scott, Foresman & Co., 1918. Pp. 396.

Appendices contain a glossary of technical language terms and a startlingly long list of abbreviations useful presumably for pupils in stenography, typewriting, and other forms of commercial English.

Graded Sentences for Analysis[1] contains 1,200 sentences for analysis or diagramming which can be used with any standard grammar; the sentences are selected from standard literature and are systematically graded for class use.

Practical Exercises in English[2] is intended primarily for the upper grades and junior high school. It might, however, be used to excellent advantage for laboratory review work in the ninth or tenth grades.

A seventh- or eighth-grade language manual of an unusual type is presented in Mathes' *Composition and Grammar*.[3] A workshop, not primarily a recitation room, will be the room in which a class is busy with this text. The inductive study of language principles, abundant laboratory exercises in the form of games and topical oral and written exercises, correlation of both reading and writing with other school subjects—these are some of the more unusual features. Twenty English Club meetings, one a fortnight, are planned in the body of the text. Concerning another 1919 textbook in grammar,[4] the comment might be made that it furnishes an over-dose for any junior high-school year, except in states which by law require grammar for a year. The class using this book would consume five class periods a week for the entire year—too much grammar, at the expense of other training no less valuable. The order and sequence of grammatical topics beginning with the sentence and the function of words in a sentence is correct; newer nomenclature is followed. Abundant exercises are provided in the text. The author apparently does not agree that sentences for drill like "Here is (are) your spectacles" might well disappear in favor of less nonsensical content. Think of a book with some thousands of sentences like this: "We bought five dozen (dozens) of eggs today."

E. TEACHERS' HELPS

E. H. Webster has prepared for use in connection with his 1916 text, *English for Business*, a Teacher's Manual,[5] an 88-page paper-covered pamphlet which contains for each chapter of the text a chapter of running com-

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[1] Mary B. Rossman and Mary W. Mills, *Graded Sentences for Analysis*. New York: Lloyd Adams Noble, 1919. Pp. 77. $0.40.

[2] Roy Davis, *Practical Exercises in English*. Boston: Ginn & Co., 1919. Pp. 104.

[3] Charles Hodge Mathes, *Composition and Grammar*. Chattanooga: National Book Co., 1919. Pp. iv+248.

[4] David Sinclair Burleson, *Practical English Grammar*. Chattanooga: National Book Co., 1919. Pp. v+310.

[5] Edward H. Webster, *Teacher's Manual: English for Business*. New York: Newson & Co., 1919. Pp. 88.

ments, suggestions for teaching, supplementary laboratory activities, and questions. This should furnish material help for teachers using Webster's text.

Perhaps not appropriately classified under Teachers' Helps is the new Winston dictionary,[1] well suited for individual or class use in high-school grades. Several features distinguish this work from others of its class. First, the words themselves are printed in large type (8 point) making a word sought for easily located on a page. Second, definitions are expressed in simple words. Third, there is a wealth of illustrative sentences and phrases unusual in so small a dictionary. Two lines on the bottom of each page contain a Key to Pronunciation, involving a seemingly useless repetition. This dictionary in external appearance, size, workmanship, paper, and binding appears to be a very high-grade book.

William Leavitt Stoddard has endeavored to show in his little volume, *Everyday English Writing*[2] that every boy or girl can master the elements of good English. The book may be used as a teacher's text, or may be put directly into the hands of the pupils in the grammar grades. The first half, including chapters on Sentences, Paragraphs, and Whole Compositions, would be invaluable for the younger pupils, while the chapters on Grammar, Punctuation, and Letter-writing would be better grasped by seventh- or eighth-grade pupils. The chapter on Accuracy is undoubtedly the best. Here neatness, correct spelling, capitalization, in short, accuracy in the "small things," are all discussed and examples are freely used. The "reading side" of writing is emphasized, and references are made to Barrie, Mark Twain, Kipling, Walt Whitman, Poe, Shakespeare, and the *Atlantic Monthly*. For a discerning older student, or for a class of younger pupils under direct guidance, Stoddard's text would be well worth while.

Margaret Gray Blanton and Smiley Blanton have published a book called *Speech Training for Children*,[3] the hygiene of speech, which is probably more appropriate for progressive parents than for children or teachers. Yet, as Blanton suggests, some parents do not evince any interest in a backward child, and in that case this text may meet the needs of a teacher, especially of primary grades. The chapter, "Unhealthy Types of Speech Reaction," includes stuttering and conditions related to it, the monotonous voice, lisping, and indistinct speech. Part I is concluded with a chapter on

[1] WILLIAM D. LEWIS and EDGAR A. SINGER (editors), *The Winston Simplified Dictionary*. Philadelphia: The John C. Winston Co., 1919. Pp. xxii+820.

[2] WILLIAM LEAVITT STODDARD, *Everyday English Writing*. New York: Macmillan, 1919. Pp. vii+130.

[3] MARGARET G. BLANTON and SMILEY BLANTON, *Speech Training for Children*. New York: The Century Co., 1919. Pp. xv+261.

extra school activities, discouraging social duties, platform reading, home study, piano practice, and even athletics, pursued intensively, for the highly nervous child.

These chapters comprise Part II, "The Beginning of School Life," and "The Speech Class," wherein the teacher may see herself as others see her, and a third chapter, of about 50 pages, which gives a series of 61 exercises to be used at the teacher's (or parent's) discretion. Each exercise has its own directions; there are also instructions for giving the entire group. These exercises include games to relieve tension, or rhymes for inflection or clear articulation, or stories which may be retold or acted out.

These authors contend that the development of good speech begins at home, before the child enters school. For that reason the book seems to meet the needs of the parent more than of the teacher. But it is valuable to anyone connected with children, to anyone interested in the proper development of speech.

II. CHEMISTRY BOOKS FOR A HIGH-SCHOOL LIBRARY

NEIL E. GORDON
Director of Course for Training High-School Teachers of Chemistry
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Many times, at the beginning of the school year, chemistry teachers are asked to suggest books for their library. Very few high schools will be able to have this number of chemistry books, hence the more desirable books are placed first in each list. The price has been given because many times there is a limit to the amount of money available for such use. The prices on books changed during the war, but they are brought down to date as far as possible. The list price is subject to discount for libraries.

ELEMENTARY INORGANIC CHEMISTRY

Brownlee and Others. *First Principles of Chemistry*. Allyn & Bacon, 1915. $1.25.

McPherson and Henderson. *First Course in Chemistry*. Ginn & Co., 1915. $1.40.

Blanchard and Wade. *Foundations of Chemistry*. American Book Co. 1914. $1.25.

Smith, A. *Elementary Chemistry*. Century Co., 1914. $1.35.

NEWELL. *General Chemistry*. D. C. Heath & Co., 1914. $1.35.
MCPHERSON and HENDERSON. *Elementary Study of Chemistry*. Ginn & Co., 1917. $1.60.

ADVANCED INORGANIC CHEMISTRY

SMITH, A. *Intermediate Inorganic Chemistry*. Century Co., 1919. $1.60.
SMITH, A. *General Chemistry for Colleges*. Century Co., 1917. $2.60.
REMSEN. *Advanced Inorganic Chemistry*. Henry Holt & Co., 1908. $2.00.
MELLOR. *Modern Inorganic Chemistry*. Longmans, Green & Co., 1914. $2.00.
MCPHERSON and HENDERSON. *A Course in General Chemistry*. Ginn & Co., 1913. $2.25.
FREER. *Inorganic General Chemistry*. Allyn & Bacon, 1894. $3.00.
NEWTH. *Chemical Lecture Experiments*. Longmans, Green & Co., 1912. $2.00.
BENEDICT. *Chemical Lecture Experiments*. Macmillan, 1901. $2.00.
ROSCOE and SCHORLEMMER. *A Treatise on Chemistry*, I and II, Macmillan, 1913.
OSTWALD-FINDLAY. *Principles of Inorganic Chemistry*. Macmillan, 1902. $5.25.
RAMSAY. *A System of Inorganic Chemistry*. London: Churchill, 1891. $2.25.

PHYSICAL CHEMISTRY

WALKER. *Introduction to Physical Chemistry*. Macmillan, 1913. $5.00.
MORGAN. *Elements of Physical Chemistry*. Wiley & Sons, 1899. $3.00.
LEHFELDT. *Text Book of Physical Chemistry*. Macmillan, 1899. $3.00.
JONES. *The Elements of Physical Chemistry*. Macmillan, 1902. $4.00.
GETMAN. *Outlines of Theoretical Chemistry*. Wiley & Sons, 1913. $3.50.

POPULAR CHEMISTRY

ELWOOD HENDRICK. *Opportunities in Chemistry*. Harper & Brothers, 1917. $0.75.
DUNCAN. *Some Chemical Problems*. Harper & Brothers, 1911. $2.25.
DUNCAN. *Chemistry of Commerce*. Harper & Brothers, 1907. $2.25.
DUNCAN. *New Knowledge*. A. S. Barnes, 1905. $2.40.
CZAPEK. *Chemical Phenomena*. Harper & Brothers, 1911. $1.00.
MARTIN. *Triumphs and Wonders of Modern Chemistry*. Van Nostrand, 1915. $2.00.

STEELE. *Popular Chemistry.* American Book Co., 1906. $1.00.
BASKERVILLE. *Municipal Chemistry.* McGraw-Hill Book Co., 1911. $5.00.
FARADAY. *Chemical History of the Candle.* Harper & Brothers, 1862. $1.00.
HAWK. *What We Eat and What Happens to it.* Harper & Brothers. $1.35.
BIRD. *Modern Science Reader.* Macmillan, 1911. $1.00.
HENDRICK. *Every Man's Chemistry.* Harper & Brothers, 1917. $2.00.
FINDLAY. *Chemistry in the Service of Man.* Longmans, Green & Co., 1917. $2.00.
BROWNLEE and Others. *Chemistry of Common Things.* Allyn & Bacon, 1914. $1.50.
LASSAR COHN. *The Chemistry of Daily Life.* J. B. Lippincott Co., 1898. $1.75.
OSTWALD. *Conversations,* Wiley & Sons, 1911. Part I, $1.50, Part II, $2.00.
JOHNSTON. *Chemistry of Common Life.* D. Appleton & Co., 1903. $2.25.
MARTIN. *Story of a Piece of Coal.* D. Appleton & Co., 1896. $1.00.

HISTORICAL CHEMISTRY

VENABLE. *History of Chemistry.* D. C. Heath & Co., 1894. $1.00.
VON MEYER-MCGOWAN. *History of Chemistry.* Macmillan, 1891. $2.50.
BROWN. *A History of Chemistry.* P. Blakiston's Son & Co., 1913. $3.50.
MUIR. *The Story of Alchemy.* D. Appleton & Co., 1903. $0.75.
RAMSAY. *Gases of the Atmosphere.* Macmillan, 1896. $2.00.
JONES. *A New Era in Chemistry.* Van Nostrand, 1913. $2.00.
CARNEGIE. *Law and Theory in Chemistry.* Longmans, Green & Co., 1894. $1.50.
VENABLE. *The Development of the Periodic Law.* Chemical Publishing Co., 1898. $2.50.
MUIR. *Heroes of Science, Chemists.* S. P. C. K., 1883. $1.00.
ROSCOE. *John Dalton.* Century Science Series, Macmillan, 1895. $1.25.
ROBERTS. *Famous Chemists.* George Allen & Co., 1911. $1.00.
THORPE. *Humphrey Davy.* Macmillan, 1896. $0.60.
THOMPSON. *Michael Faraday.* Macmillan, 1899. $0.60.
SHENSTONE. *Justus von Liebig, His Life and Work.* Macmillan, 1895. $0.60.
MUIR. *A History of Chemical Laws and Theories.* Wiley & Sons, 1907. $4.00.
THORPE *Essays in Historical Chemistry.* Macmillan, 1894. $4.00.

ORGANIC CHEMISTRY

NORRIS. *Organic Chemistry*. McGraw-Hill Book Co., 1912. $2.50.

MOORE. *Outlines of Organic Chemistry*. Wiley & Sons, 1915. $1.60.

PERKINS and KIPPING. *Organic Chemistry*. J. B. Lippincott Co., 1894. $2.50.

NORRIS. *Experimental Organic Chemistry*. McGraw-Hill Book Co., 1915. $1.25.

NOYES. *Organic Chemistry for the Laboratory*. Chemical Publishing Co., 1897. $2.00.

GATTERMANN-SHOBER. *Practical Methods of Organic Chemistry*. Macmillan, 1901. $1.75.

QUALITATIVE CHEMISTRY

NOYES. *Qualitative Analysis*. Henry Holt & Co., 1901. $1.25.

TREADWELL and HALL. *Qualitative Analysis*. Wiley & Sons, 1916. $3.00.

STIEGLITZ. *Qualitative Analysis*, 2 vols. Century Co., 1919. $2.50.

SCOTT. *Standard Methods in Qualitative Analysis*. Van Nostrand, 1917. $6.00.

FRESENIUS. *Qualitative Chemical Analysis*. Wiley & Sons, 1890. $4.50.

QUANTITATIVE CHEMISTRY

MAHIN. *Quantitative Analysis*. McGraw-Hill Book Co., 1914. $3.00.

TREADWELL and HALL. *Quantitative Analysis* (4th ed.) Wiley & Sons, 1916. $3.50.

FRESENIUS. *Quantitative Chemical Analysis*. Wiley & Sons, 1881. $12.50.

INDUSTRIAL CHEMISTRY

ROGERS. *Manual of Industrial Chemistry*. Van Nostrand, 1916. $5.00.

THROPE. *Outline of Industrial Chemistry*. Macmillan, 1911. $3.75.

HUNTINGTON and MCMILLAN. *Metals*. Longmans, Green & Co., 1897. $2.50.

WAGNER. *Manual of Chemical Technology*. D. Appleton & Co., 1895. $8.50.

THROPE, T. E. *Dictionary of Applied Chemistry*, 5 vols. Longmans, Green & Co., 1912-13. $90.00.

FOOD CHEMISTRY

WILEY. *Foods and Their Adulterations*. P. Blakiston's Son & Co., 1917. $4.00.

BAILEY. *Laboratory Experiments on Food.* P. Blakiston's Son & Co., 1915. $0.25.

WOODMAN and NORTAN. *Air, Water and Food from a Sanitary Standpoint,* (4th ed.) Wiley & Sons, 1914. $2.00.

RICHARDS and ELLIOTT. *Chemistry of Cooking and Cleaning.* Home Science Publishing Co., 1897. $1.00.

RICHARDS. *Food Materials and Their Adulterations.* Home Science Publishing Co., 1886. $1.00.

OLSON. *Pure Foods.* Ginn & Co., 1911. $1.25.

SNELL. *Elementary Household Chemistry.* Macmillan, 1914. $1.50.

GRANT. *Chemistry of Bread Making.* Longmans, Green & Co., 1917. $1.40.

WOODMAN. *Food Analysis.* McGraw-Hill Book Co., 1915. $3.00.

WINTON. *Microscopy of Vegetable Foods.* Wiley & Sons, 1916. $6.00.

WATER

MASON. *Examination of Water.* Wiley & Sons, 1899. $1.25.

HAZEN. *Clean Water and How to Get it* (2nd ed.) Wiley & Sons, 1914. $1.50.

FORTIER. *Use of Water in Irrigation.* McGraw-Hill Book Co., 1916. $2.00.

THRESH. *The Examination of Water and Water Supplies.* P. Blakiston's Son & Co., 1913. $5.00.

CYCLOPEDIAS

OLSEN. *Chemical Annual.* Van Nostrand, 1918. $2.50.

Handbook of Chemistry and Physics. Cleveland: Chemical Rubber Co., (6th ed.), 1917. $2.00.

MEADE. *The Chemists' Pocket Manual.* Chemical Publishing Co., 1917. $3.00.

MERCK. *Merck's Index.* New York: Merck & Co., 1917.

PERIODICALS

The Journal of the American Chemical Society. Published monthly by the American Chemical Society, Easton, Pennsylvania.

The Journal of Industrial and Engineering Chemistry. Published monthly by the American Chemical Society, Easton, Pennsylvania.

Chemical Abstracts. Published twice a month by the American Chemical Society, Easton, Pennsylvania.

Science, Published weekly by The Science Press, Lancaster, Pennsylvania.

School Science and Mathematics. Chicago: 5517 Cornell Avenue. Monthly.
School Review. Chicago: The University of Chicago. Monthly.

There is no way of keeping in touch with the chemical work like reading one journal regularly. The first two above publish original articles. The third contains a review of all chemical research. Numbers four, five, and six publish articles on all the sciences, while, in addition, the last two contain articles on the teaching of chemistry.

The first three are issued to members of the American Chemical Society at a very great reduction in price.

III. CURRENT PUBLICATIONS RECEIVED DURING THE PAST MONTH

A. GENERAL EDUCATIONAL METHOD, HISTORY, THEORY, AND PRACTICE

French Educational Ideals of Today. Edited by Ferdinand Buisson and Frederic Ernest Farrington. Yonkers-on-Hudson, New York: World Book Co., 1919. Pp. xii+326. $2.25.

NEWTON, A. W. *The English Elementary School.* New York: Longmans, Green & Co., 1919. Pp. viii+299. $2.00.

STARCH, DANIEL. *Educational Psychology.* New York: Macmillan, 1919. Pp. ix+473.

TERMAN, LEWIS M. *The Intelligence of School Children.* Boston: Houghton Mifflin Co., 1919. Pp. xxii+317. $1.75.

B. BOOKS PRIMARILY FOR ELEMENTARY-GRADE TEACHERS AND PUPILS

KERN, O. J. *Outlines of Course of Instruction in Agricultural Nature Study for the Rural Schools of California.* Berkeley, California: College of Agriculture, University of California, 1919. Pp. 55.

KERN, O. J. *Outline Studies on the School Garden, Home Garden, and Vegetable Growing Projects.* Berkeley, California: College of Agriculture, University of California, 1919. Pp. 63.

LEWIS, HOMER P. *The A. B. C. Primer.* Philadelphia: J. B. Lippincott Co., 1910 Pp. 128. $0.50.

O'HARA, JOHN P. *A History of the United States.* New York: Macmillan, 1919. Pp. xii+461. $1.20.

C. BOOKS PRIMARILY FOR HIGH-SCHOOL TEACHERS AND PUPILS

CHAMBERLAIN, A. H., and J. F. *Thrift and Conservation.* Philadelphia: J. B. Lippincott Co., 1919. Pp. 272. $1.40.

CHANNING, EDWARD. *Students' History of the United States.* New York: Macmillan, 1919 (fourth revised edition). Pp. xxxi+627+xxix.

CHANNING, EDWARD. *The United States in the Great War.* Supplement to *Students' History of the United States.* New York: Macmillan, 1919. Pp. 599–627.

DAVIS, KARY CADMUS. *Horticulture.* Philadelphia: J. B. Lippincott Co., 1919. Pp. vi+416.

FOERSTER, NORMAN, and STEADMAN, J. M., JR. *Sentences and Thinking.* Boston: Houghton Mifflin Co., 1919. Pp. iv+121. $0.75.

FORD, WALTER BURTON, and AMMERMAN, CHARLES. *Teachers' Manual, First Course in Algebra.* New York: Macmillan, 1919. Pp. 341.

The Fundamentals of Citizenship. Reconstruction Pamphlets, No. 6, June, 1919. Washington, D. C.: Committee on Special War Activities, National Catholic War Council. Pp. 92.

GRUENBERG, BENJAMIN C. *Elementary Biology.* Boston: Ginn & Co., 1919. Pp. x+528. $1.56.

JOHNSON, EMIL A. *Furniture Upholstery.* Peoria, Illinois: Manual Arts Press, 1919. Pp. 64. $1.00.

JONES, H. S. V. *Words and Sentences.* New York: Henry Holt & Co., 1919. Pp. iii+150.

A Program for Citizenship. Reconstruction Pamphlets, No. 5, July, 1919. Washington, D. C.: Committee on Special War Activities, National Catholic War Council. Pp. 14.

QUINTERO, S. and J. ALVAREZ. *La Muela del Rey Farfán.* Edited by Aurelio M. Espinosa. Yonkers-on-Hudson, New York: World Book Co., 1919. Pp. xii+93. $0.60.

D. PUBLICATIONS OF THE UNITED STATES BUREAU OF EDUCATION AND SIMILAR MATERIAL IN PAMPHLET FORM

Recent issues of the Bureau of Education:

Bulletin No. 8, 1919—*Life of Henry Barnard.*

Bulletin No. 36, 1919—*Education in Italy.*

Bulletin No. 38, 1919—*Education in Switzerland, 1916–1918.*

Bulletin No. 41, 1919—*An Educational Study of Alabama.*

Bulletin No. 42, 1919—*Monthly Record of Current Educational Publications.*

Nineteenth Annual Report of the Director of Education. Manila, Philippine Islands: Bureau of Education, 1919. Pp. 195.

VINCENT, GEORGE E. *The Rockefeller Foundation, Review for 1918.* New York: Rockefeller Foundation, 1919. Pp. 40.

E. MISCELLANEOUS PUBLICATIONS

BETTS, GEORGE HERBERT. *How to Teach Religion.* New York: Abingdon Press, 1919. Pp. 223. $1.00, postage extra.

HILL, JOHN G. *The Prophets in the Light of Today.* New York: Abingdon Press, 1919. $1.25.